The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XX. No. 511 APRIL 13, 1929 Prepaid Annual Subscription: United Kingdom, £1.1.0; Abroad, £1.5.0.

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Telegrams: "Allangas, Fleet, London." Telephone: City 0244

I.C.I. Developments

THE most striking evidence of the immense developments proceeding in Imperial Chemical Industries, Ltd., is the directors' decision to increase the authorised capital from £75,000,000 to £95,000,000, and to issue £20,000,000 new capital in the form of 10s. shares, increasing the issued total from £65,745,661 to £85,745,661. The number of men and women in the company's works and offices, which a year ago stood at 40,000, is now approximately 53,000. At the annual meeting of shareholders in the Central Hall, Westminster, on April 18, Lord Melchett may be expected to review in detail the business of the year and to explain the new extensions that call for additional capital. In the meantime, the annual report, issued as an eighteen-page pamphlet, gives a general idea of what has happened during the past twelve months.

In spite of depression in certain sections of industry, the volume of the company's trade shows substantial progress. There are few important trades which are not served in some way by one or other of the company's products and this diversity of application provides in the company's total output a fair index of the general trade of the country. Economies effected by the merger have been reflected in the lower prices at which the company has been enabled to market some of its more important products, and many of the larger industrial undertakings have expressed themselves as highly satisfied with the services placed at their disposal.

In the heavy chemical field, the position of the company as one of the predominant manufacturers of heavy chemicals in the world has been maintained. On the ammonia soda side an extensive modernisation programme has been practically completed and the increased efficiency resulting therefrom is already apparent. The increased production of artificial silk has resulted in a demand for more caustic soda and chlorine. To satisfy this demand additional plant has been brought into operation and the erection of further units has been begun. Consideration is being given to the reorganisation of the company's sulphuric acid manufacture. Productive capacity in this country is in excess of requirements and manufacture is at present being carried on in a large number of small plants most of which are working inefficiently. A plant to manufacture cement and sulphuric acid from anhydrite is in course of construction. Early in 1929 a plant for the manufacture of methanol from water gas was started up, while a plant for the production of acetic acid is well advanced.

Fertilisers and Dyestuffs

PRODUCTION of fertilisers at the works of Synthetic Ammonia and Nitrates at Billingham is reported to have proceeded during the year in accordance with the company's plans. The first of the large units was completed early in 1928, the second will be started up shortly, and the third should be completed by the end of 1929. This will complete the building programme embarked upon two years ago. The products manufactured include sulphate of ammonia, nitro-chalk, ammonium nitrate, sodium nitrite, nitric acid, ammonium bicarbonate, anhydrous ammonia and methanol, and a plant for the production of complete fertilisers will be finished by the end of 1929. Upwards of a quarter of a million tons of nitrogen products were made during 1928, and were introduced on the market, mainly as sulphate of ammonia. For certain plants and under certain conditions, a nitrate form of nitrogen is preferable to the ammonia form, and for this need there is now being provided a new fertiliser "Nitro-Chalk," which supplies nitrogen in both the nitric and the ammoniacal forms, thus combining quick action with lasting effect. "Nitro-Chalk" has been available in bulk since the beginning of 1929 and is being received with favour both at home and abroad.

The greater portion of the increased production of nitrogen has been sold overseas, and notable progress has been made in the Far East, especially in China. Work in India is being prosecuted with unabated vigour, where the use of fertilisers should result in time in the attainment by the native population of a higher standard of living. At home, the reduction of arable acreage has curtailed the market for nitrogenous fertilisers in that direction, but the increasing popularity of the intensive system of grassland management has enabled the total consumption to be maintained. In Scotland the formation of Scottish Agricultural Industries will, it is anticipated, enable the farmer to obtain cheaper and more suitable fertilisers and better service than he has had in the past. Advance has been made in the domain of agricultural research and experiment. The research station at Jealott's Hill Farm has now been completed, and will form yet another link in the great chain of scientific institutions now being forged throughout the Empire.

Satisfactory progress in dyestuffs is being made both technically and commercially, and several important additions have been made to the range of colours produced. The policy of the British Dyestuffs Corporation, one of the four original constituent entities of the company, represents in effect a national attempt to establish a British industry which has as its objective the independence of this country in the production of dyestuffs and organic chemicals. With this end in view, the company has made substantial reductions in the prices of dyestuffs, representing a considerable present sacrifice, but justifiable as tending to place this side of the business on a more healthy basis, and at the same time giving assistance to dye users.

The company's interest in leather cloth, cellulose products, paints, varnishes, etc., is large, and increased returns on the capital invested have resulted. Sales of the cellulose enamel "Belco" have increased as a result of its growing use for the automobile and other industries. The expanding demand for leather cloth for motor cars has stimulated sales of artificial leather cloth.

Overseas Progress

IMPERIAL Chemical Industries' interests in the principal Dominions are, without exception, progressing satisfactorily. In Canada, the activities of Canadian Industries, Ltd., continue to develop. In Australia and New Zealand progress is also satisfactory, particularly in the awakening of interest among the farming population in the use of nitrogenous fertilisers. India, too, shows great development in this and other directions. In South Africa, African Explosives and Industries, Ltd., has shown further progress during the past year. On the fertiliser side a further 50,000-ton superphosphate plant is about to be erected. In the Near East, offices have been opened in Egypt and in Palestine, and the staffs at these offices, as well as the company's agents and representatives from Persia to the Balkans, will be active in their efforts to expand British trade both in the mandated and in the neighbouring territories. In South America, the previous organisations of Imperial Chemical Industries have been strengthened by the formation of selling companies on the River Plate, in Brazil, in Chile and in Peru. In China and Japan, where difficult conditions have been encountered, the year's record is entirely satisfactory. A considerable amount of research work has been carried out during the year on possible further developments arising out of the company's activities.

The company's relations with the trade unions continue to be of a friendly character. The trade union leaders are aware of the company's desire to benefit by their experience, and it is hoped shortly to suggest means whereby an even closer contact with them may be obtained. The new building, Imperial Chemical House, is owned by a separate subsidiary company, and the necessary finance has been arranged on favourable terms by means of a long term loan from one of the leading insurance companies. The Finance Company of Great Britain and America, Ltd., in which I.C.I. has a half interest, has achieved satisfactory results.

In conclusion, the reports states, in the early months of the year there was some promise of a revival of general trade activity, but as the year progressed these hopes were not altogether fulfilled. In the circumstances the directors consider the results for 1928 very satisfactory.

The United States Potash Decree

THROUGH the kindness of an American correspondent, we have been favoured with a copy of the decree, dated February 29, 1929, of the District Court of the United States for the Southern District of New York in the case of the United States of America (petitioner) *v.* Deutsches Kalisyndikat Gesellschaft, Société Commerciale des Potasses d'Alsace, *et al.* (defendants). The cabled reports of the case at the time were rather brief and obscure, but the official text of the decree, together with the filed explanatory statement by W. J. Donovan, assistant to the Attorney-General, makes the issues quite clear. Essentially, the effect of the decree, which is accepted by both the German and the French interests, is to bring the operations of the defendant companies within the terms of the anti-trust laws of the United States. After the Government petition had been presented, the French defendants in May of 1927 moved to set it aside on the ground that the suit was, in fact, one against the French Republic, the owner of the French potash mines. This motion, however, was dismissed, and finally terms were mutually agreed on to be embodied in a consent decree.

Under this decree, the defendants, both German and French, are perpetually restrained from:—

(*a*) Agreeing upon among themselves within the United States or carrying out within the United States any contracts, or agreements, or understandings, fixing the prices or terms at which potash salts shall be sold by the defendants in the United States, or the amounts or quotas to be sold by them within the United States.

(*b*) Maintaining separate selling offices or agencies in the United States which, by agreement or understanding, shall sell potash salts at prices or terms or in quantities or by quota fixed by agreement among the defendants, or shall divide territory or customers by agreement among the defendants.

(*c*) Establishing a joint selling agency or agencies within the United States to sell the potash salts of the defendants within the United States.

(*d*) Fixing or maintaining resale prices, resale terms, resale discounts, resale allotments of territory, or any resale restrictions or conditions whatever with respect to potash salts sold within the United States.

(*e*) Discriminating, directly or indirectly, between purchasers, dealers, or consumers, of potash salts located within the United States, when such discriminations are not based on: (1) differences in quantities purchased, (2) differences in costs of transportation or delivery, (3) differences in competitive conditions in a particular locality, (4) differences in grade or quality, (5) reasonable classification of customers, where such classification does not tend substantially to lessen competition or tend to create a monopoly. But no discrimination in the sale of potash salts shall be made for the purpose of restraining the trade of any person.

There is a proviso that the decree shall not prevent the defendants from selling and delivering potash salts outside of the United States to a corporation organised under the laws of any other country, nor prevent such corporation from selling and distributing in the United States potash salts so acquired through the usual facilities for sale and distribution, including agents, agencies, branch offices, and other normal channels. Sub-sections (*d*) and (*e*), however, apply to sales by the corporation to others within the United States, and these prohibit the fixing of resale prices, etc., and discrimination between purchasers.

The Pollution of the Atmosphere

As the result of a leading article recently published in *The Times*, stressing the desirability of eliminating sulphur from the fuel consumed in London, three interesting letters, dealing with various aspects of atmospheric pollution, have appeared in the columns of that journal. Professor J. S. Haldane points out that by means of smokeless fuel we can get rid of the black smoke, but only to a limited extent can sulphur be eliminated from solid fuel derived from coal. "On the other hand, smokeless fuel in the form of gas eliminates sulphur almost completely, and it appears that it is only through the use of fuel in the form of purified gas that we can look for a practical remedy for the troubles due to sulphuric acid in the air."

Professor Haldane also touches on the question of the production of sulphuric acid in the waste gases of electricity generating stations, and this point is further developed by Professor M. W. Travers. The latter points out that although, from the standpoint of engineering, the vast power stations for the supply of electricity which are springing up all over the country approach perfection, the engineer, while concentrating his attention on fuel efficiency, has totally neglected one aspect of the problem, namely, the disposal of the sulphuric acid-laden gases from his chimneys; and the chemist, in whose domain such problems properly lie, has not been consulted. The waste gases from power stations, Professor Travers points out, pass through dust settling chambers at a temperature most favourable for the maximum conversion of the sulphur into sulphuric acid. Finally the waste gases leave the station through low chimney stacks of large diameter. "Since the waste gas from a ton of coal generally contains 40 lb. to 50 lb. of sulphur, it is clear that an output of 10 tons of sulphur, or of three times that quantity of sulphuric acid, does not represent the output from a very large power station."

Finally, Dr. R. Lessing indicates that a further problem created by the operation of large boiler plants of the mechanical stoker or powdered fuel type, in or near towns, is the emission from the chimney stacks of mineral dust, as distinct from smoke and sulphur gases. Abatement of the pollution of air with dust and sulphur can, however, he points out, be effected by the use of clean coal or coke.

These opinions indicate how serious and urgent is the question of atmospheric pollution. The problem of water pollution is, at long last, being investigated systematically. It would be an excellent thing if the atmospheric question were tackled at once in the same way.

Books Received

DIE KUNSTLICHEN HARZE. By Johannes Scheiber and Kurt Sändig. Stuttgart: Wissenschaftliche Verlagsgesellschaft m.b.h. Pp. 376. M. 26.

SELF AND SOCIETY BOOKLETS. London: Ernest Benn, Ltd. 6d. each.:—

No. 13. Parliament and the Consumer. By A. V. Alexander. Pp. 32.

No. 14. The Making of an Educationist. By Albert Mansbridge. Pp. 35.

No. 15. Twenty Faces the World. By Percy Redfern. Pp. 32.

No. 16. Everyman's Statistics. By J. W. F. Rowe. Pp. 39.

No. 17. The Wilderness of American Prosperity. By LeRoy E. Bowman. Pp. 36.

No. 18. The Nation and Its Food. By Rt. Hon. C. Addison. P. 32.

BAYLEY'S CHEMISTS' POCKET BOOK. By Thomas Bayley. Edited by Robert Ensoll. London: E. and F. N. Spon, Ltd. Pp. 460. 8s. 6d.

The Calendar

Apl. 16	Oil and Colour Chemists' Association: Eleventh Annual Dinner. 7 p.m.	Connaught Rooms, Kingsway, London.
16	Hull Chemical and Engineering Society: General Meeting.	Grey Street, Park Street, Hull.
17	Society of Glass Technology: Annual General Meeting. "The History of Glass Cutting." W. Butterworth.	Sheffield.
17	Royal Society of Arts: "Vita Glass." F. E. Lamplough. 8 p.m.	John Street, Adelphi, London.
17	Institute of Metals (Swansea Section): Annual General Meeting. 7 p.m.	Thomas's Café, High Street, Swansea.
18	Imperial Chemical Industries, Ltd. Annual General Meeting: 12 noon.	Central Hall, Westminster, London
19	Physical Society: Fourteenth Guthrie Lecture by Professor P. W. Bridgman on the Properties of the Elements under High Pressures. 5 p.m.	Imperial College of Science, London
24	British Science Guild: Developments of British Chemical Manufactures. "Fertilisers from the Air." Sir Frederick Keeble. "Rayon (Artificial Silk)." A. B. Shearer. "Synthetic Drugs." Francis H. Carr. 4.30 p.m.	Mansion House, London.
25	Chemical Society: T. W. Richards Memorial Lecture. Sir Harold Hartley. 5.30 p.m.	Institution of Mechanical Engineers, London.
May 1	Society of Public Analysts. 8 p.m.	Burlington House, London.
2	Chemical Society. 8 p.m.	Burlington House, London.
6	Society of Chemical Industry (London Section): Annual Meeting. "Recent Advances in Low Temperature Preservation of Foodstuffs." Dr. T. Moran.	Burlington House, London.
9	Oil and Colour Chemists' Association: "Painting as it Affects the Railways." F. Fancutt. 7.30 p.m.	30, Russell Square, London.
9	Optical Society. 7.30 p.m.	Imperial College of Science, London.

Papers on Coal Distillation Products

Meeting of London Section of the Society of Chemical Industry

A joint meeting of the London Section and the Fuel Section of the Society of Chemical Industry was held at Burlington House, London, on Monday, Mr. W. J. A. Butterfield (chairman of the London Section) presiding.

Two papers were read at the meeting, the first being on " Free Carbon Formation in Tars and Pitch," by Mr. W. Gordon Adam and Mr. J. S. Sach. Owing to Mr. Adam's illness, the paper was read by Mr. F. M. Potter.

The paper pointed out that all high-temperature coal tars and the pitches derived from them contain a varying percentage of insoluble matter, the so-called free carbon. The free carbon content of a tar has usually been considered as the material insoluble in organic solvents, those usually employed in analytical determinations being carbon disulphide, benzene, toluene, aniline and pyridine. Except in the work of Hodurek and of Berl and Schildwachter, there did not appear, said the authors, to have been any attempt to differentiate clearly between the results obtained with different solvents.

Origin of the Present Work

The results given in the present paper were extracted from work undertaken by the Gas Light and Coke Co., with a view to classifying the known methods of tar distillation with respect to their free-carbon-formation characteristics, it being recognised that the higher the free carbon formation during the distillation process, the lower the yield of the relatively valuable creosote oil and the higher the yield of the less valuable standard softening-point pitch. High pitch yields were accompanied by a degradation in the quality of the pitch, the free carbon content increasing and the volatile matter test decreasing.

In the course of this work, it was found that the character of the solvent employed was a much more important factor in the examination of pitch than of tar, and an attempt had been made to classify the results obtained with aromatic hydrocarbon solvents and with aromatic basic solvents, and to show the effect of the time and temperature factors in the distillation process on the results obtained with these two classes of solvents.

Derivation of Free Carbon

The so-called free carbon present in the crude tar was derived mainly from the decomposition of the volatile matter of the coal in the retort or oven by the radiant heat or sensible heat of the retort surface, and increased with temperature and time of exposure of the vapours thereto. Thus, horizontal retort tars were usually distinguished by the relatively high free carbon content as compared with coke oven and vertical retort tars, but the percentage of free carbon in horizontal retort tars might vary widely with the free space in the retort, and with the temperature of the retort heating flues.

Hodurek had distinguished the actual suspended matter in a crude tar, to which he gave the symbol C_1, from the matter precipitated by benzene, which he called C_2 and assumed to be of a bituminous resin nature. The percentage figure usually returned in this country for free carbon represented the total C_1+C_2, and it had been found by the experiments carried out by the authors that the ratio of the original insoluble matter C_1 to the total matter insoluble in benzene, C_1+C_2, varied with the nature of the tar.

Experiments in the laboratories at Beckton showed that benzene and toluene gave closely similar results for the insoluble matter C_1+C_2, and this was in agreement with the method for free carbon determination recommended by the Joint Tar Testing Committee, and adopted by the British Road Tar Association in the analytical appendix to their standard specification.

Interpretation of Results

After giving tables of results obtained from the experiments, the authors suggested that the results indicated that while toluene might be a suitable solvent for the practical examination of crude tars, it was not suitable for the differentiation of samples of coal tar pitch unless used in conjunction with the parallel determination using pyridine as the solvent.

The large-scale method of distillation of tar to oils and pitch in use at Beckton consisted of a dehydration stage, employing Wilton coils, followed by further distillation in pot stills, a method originally adopted to enable the plant to cope satisfactorily with crude tars of relatively high free carbon and water content. The period of distillation in the continuous Wilton coils was 20 minutes and in the stills 6 to 7 hours. Passage through two Wilton coils in series might be employed for the preparation of soft pitches or heavy tars for road-making purposes. The formation of insoluble matter during these stages of distillation was examined, the figures being calculated in all cases back to the crude tar. Results showed that during the dehydration stage at 170° C., no insoluble matter was formed, the ratio of the figure for the dehydrated tar to that for the crude tar being substantially unity. The passage through the second coil tended to give rise to an increase in the insoluble matter content.

At a later period, the study of the second stage of the distillation was completed, and for comparison similar tests were made on vertical and horizontal retort tars, employing the Wilton coil and pot still, and on coke oven tars employing double pot stills and also a Hird continuous unit. This work showed that while the pyridine insoluble matter C_1 remained practically constant—except in the vertical retort tar where a definite increase was shown—there was a very marked increase in the toluene—insoluble matter. Further, the increase in insoluble matter was higher in the case of the vertical retort tar than for horizontal retort tar under similar conditions.

A series of heat treatments were carried out using an autoclave. As a result, a unit had been designed (B.P. 303,038) with the object of preventing the formation of free carbon as far as possible. The Crude Tar Panel of the Standardisation of Tar Products Tests Committee had designed a 5-litre iron still directly heated by gas for laboratory work, and certain tests were carried out with this apparatus, the results being given in further tables.

Conclusions

Although circumstances had prevented the completion of the work, it was suggested that sufficient evidence had been obtained to allow the following conclusions to be drawn :—

(1) The formation of pyridine-insoluble matter in a tar during distillation indicated local overheating. In a modern distillation unit the formation ratio should approximate very closely to unity. Factors favouring the desired result were :— (*a*) Minimum final temperature in the tar obtained by employing a high vacuum or by the use of free steam. For distillation to briquetting pitch, final tar temperatures should not exceed 280 to 300° C. ; (*b*) The time of exposure of the tar to the maximum temperatures should be reduced to a minimum, a result obtained by continuous distillation methods, particularly in a coil type unit.

(2) The formation of toluene-insoluble matter during distillation might be reduced by employing a plant designed with recognition of the factors (*a*) and (*b*) above. The formation ratio was, however, very largely dependent upon the history of the tar prior to re-distillation. The lower the temperature employed in the coal carbonising process, the higher the alkali-soluble content of the tar, and the greater its tendency to form toluene insoluble compounds during distillation. It would appear that the so-called bituminous resin compounds formed during the tar distillation were derived, not from the saturated or unsaturated hydrocarbons, but from the alkali-soluble fraction.

Low-Temperature Aqueous Liquors

In a paper entitled " Aqueous Liquors from Low-Temperature Carbonisation of Coal," Dr. D. D. Pratt (of the Chemical Research Laboratory, Teddington), gave an account of work carried out there in collaboration with Dr. G. T. Morgan and Mr. A. E. J. Pettet. This was referred to as a logical extension of the work already done on the study of low-temperature tars. The employment of steam in many processes led to the production of large quantities of aqueous liquors, the contents of which could not be overlooked in any estimate of the yields obtained by decomposition of the coal.

The present paper described the work done with two types of aqueous products: one from the hydraulic main of the carbonisation plant, and the other from the distillation of the tar. The source of the supplies of what were referred to as liquor and distillate was H.M. Fuel Research Station. Complete details of the apparatus and methods employed were given, continuous extraction by ether being the method adopted.

Results of the Investigation

It was shown that the total ammonia content, which in the case of the liquor was 0·55 per cent., was increased three-fold in the distillate. The sulphur content was increased slightly in the distillate as compared with the liquor, and on acidification by mineral acid the liquor yielded hydrogen sulphide and the distillate sulphur dioxide and elemental sulphur. Aniline, pyridine and picoline had been isolated from both the liquor and the distillate. Resinamines occurred to a small extent in the bases from the liquor. Formic, propionic, *n*-butyric and *n*-valeric acids had been identified, and acetic, oxalic and resinoic acids had been isolated from the acids of the liquor. Phenol occurred to the extent of 0·15 per cent. of the liquor and 0·2 per cent. of the distillate, while catechol was present in amount corresponding to 0·1 per cent. of the liquor, but was only detected in traces in the phenols from the distillate. A new class of resin (resinolic acids) had been characterised and isolated from the phenols of the liquor, while resinols mixed with resinenes occurred in the viscous portion of the phenols from the distillate.

Source of the Products

The coal from which the liquor and the distillate were obtained was of a non-coking type derived from the slate section of the Warwickshire thick seam (Keresley colliery), the ultimate analysis being (per cent.):—Ash 4·5, carbon 76·08, hydrogen 5·05, nitrogen 1·0, sulphur 1·14, difference (oxygen and errors) 12·23. The mean C : H ratio was 15·1 : 1. The coal was carbonised at 625° C. in vertical retorts of the D type (a modification of the E type described in H.M. Fuel Research Technical Paper No. 17). During carbonisation, steam was introduced to the extent of 10·72 per cent. of the coal, which as charged had a moisture content of 8·98 per cent. The yield of liquor was 59·5 gallons per ton of coal, and of this amount 16·86 gallons represented water of decomposition of the coal. The yield of tar, which was separated from the liquor in a labyrinth separator, amounted to 21·7 gallons per ton of dry coal. On distillation up to 170° C. (vapour temperature), the tar yielded, together with light oil, an aqueous distillate averaging 7 gallons per ton of tar.

The S.C.I. Annual Meeting

American and Canadian Visitors

THE committee appointed by the Executive Committee of the American Section of the Society of Chemical Industry to promote attendance and to make arrangements for transportation in connection with the annual general meeting of the Society in Manchester, are circulating the following message from President Little:

"To the American and Canadian members of the Society of Chemical Industry:

"The annual meeting of the Society in Manchester, England, during the week of July 8 affords an opportunity, of which it is hoped many may take advantage, to consolidate the friendships so happily begun at our meetings of last year and to establish many new ones under peculiarly favourable auspices. As it is my pleasant duty to preside at the Manchester meetings, I earnestly hope that I may have the support of many of you, and a goodly representation from this side will be regarded as a compliment to our British friends. Those of you who have enjoyed the gracious charm of English hospitality will need no urging to bring you under its influence again; to those of you who have not done so the Manchester meeting provides an opportunity which I hope none of you who can arrange to take the trip will fail to utilise.

"Mrs. Little and I are sailing on the *Homeric* on June 15, and it would give us especial pleasure to be accompanied by as many of the members and friends of the Society as can make it convenient to sail upon that date.

"ARTHUR D. LITTLE."

Society of Public Analysts

AN ordinary meeting of the Society of Public Analysts was held at the Chemical Society's Rooms, Burlington House, London, on Wednesday, April 3, the president, Mr. Edward Hinks, being in the chair. Certificates were read for the first time in favour of A. N. Leather, R. H. Morgan, and W. G. Painton. Certificates were read for the second time in favour of P. T. Clarke, A. C. James, H. Lee, J. F. Morse, L. J. Odling, and W. H. Wilkinson. The following were elected members of the Society: F. Atkins, E. B. Bennion, J. Haslam, S. G. Kendrick, B. Jones, J. U. Lewin, and L. J. Walker.

Furfural in Honey

"Furfural and Diastase in Heated Honey" was the subject of a communication by Dr. L. H. Lampitt, E. B. Hughes, and H. S. Rooke. Modifications of Fiehe's test and the aniline acetate test for furfural have been devised, which give strong reactions with honey containing 5 per cent. of added invert sugar. If honey gives pronounced reactions with both of these tests it is probably adulterated, unless there is evidence that it has been strongly heated. Such honey has usually been found to be caramelised and unfit for use. Honey heated for 24 hours at 60° C. usually gives negative results in the furfural tests, both immediately and after storage for several months. There is definite evidence that honey contains two diastatic enzymes, for it reacts with starch, yielding both dextrins and reducing sugars. If honey is heated above 85° C. its diastatic activity is very rapidly destroyed.

Sewage and Water Analysis

Mr. J. W. Haigh Johnson read a paper entitled "Further Notes on Methods of Sewage and Water Analysis; Anti-Oxidation and Stabilisation of Pollution." Comparative results on river waters have shown that the graph standard method is much to be preferred to the Royal Commission's test, owing to its superior technique and adaptability. The results given by the latter method are usually only half those given by the former. Three main types of biological oxidation curves are recognisable for polluted liquids: (1) Unstable type, characterised by very rapid, fairly uniform absorption of not more than 5 days' duration, followed by (2) semi-stable type, having greatly diminished but very uniform oxidation rate, of indefinite duration, until (3) nitrification supervenes.

Type 1 indicates gross unstable pollution; type 2 indicates semi-stable pollution, and may show affinities with either 1 or 3. Correlation of biological and chemical absorption results shows that, in spite of apparent agreement, biological absorption produces an irregular effect on the chemical requirements. From one-third to two-thirds of the chemically determined organic matter is recovered from sewage during purification without any appreciable absorption of oxygen. The effect of oxygen on sewage pollution is apparently to oxidise unstable substances to the usual end-products, whilst the semi-stable substances are stabilised and precipitated as a relatively non-oxygen-absorbing mud of ever-increasing stability.

The Detection of Cobalt

"Potassium Cyanate as a Reagent for the Detection of Cobalt" was dealt with by B. J. F. Dorrington and Dr. A. M. Ward. Potassium cyanate reacts with cobalt to form a blue complex. The test, which is most sensitive when the reagent is used in alcoholic solution, is capable of detecting cobalt in a one-hundredth molar solution of cobalt nitrate. In the presence of nickel the test is applied to an ammoniacal solution of the mixed sulphides, and in the presence of iron the precipitate formed with the reagent is allowed to settle overnight, and the test applied to the filtrate. Copper should be removed before testing for cobalt.

British Chemical Developments

A PUBLIC meeting of the British Science Guild to consider developments of British chemical manufactures has been convened for Wednesday, April 24, at 4.30 p.m., at the Mansion House, London. Lord Melchett will preside, and the speakers will be Sir Frederick Keeble ("Fertilisers from the air"), Mr. A. B. Shearer ("Rayon (artificial silk)"), and Mr. Francis H. Carr, of British Drug Houses ("Synthetic drugs").

A Survey of Chromium Plating

Meeting of the Electroplaters' and Depositors' Technical Society

The Electroplaters' and Depositors' Technical Society held their provincial meeting in Birmingham recently, on which occasion a conference on chromium plating took place, the meeting being held at the Central Technical College. The president, Mr. S. Field, occupied the chair. Mr. G. E. Gardam, B.Sc., A.R.C.S., opened the conference with a paper entitled "A Survey of the Published Information on Chromium Plating."

In his survey of the literature, Mr. G. E. Gardam said that although a certain amount of information on chromium plating was previously available, development of the commercial deposition of chromium on the present scale was principally due to the work of Sargent published in 1920. The two chemicals forming the essential basis of a chromium depositing solution were shown by him to be chromic acid (CrO_3) and chromic sulphate. Subsequent investigations have demonstrated that whereas the addition of some second substance to the chromic acid is imperative, it is not necessary to employ chromic sulphate, and that sulphuric acid or certain other acids or their salts will give satisfactory results. Owing to the fact that sulphuric acid may be readily obtained in a state of high purity, coupled with the fact that sulphates are a common impurity in chromic acid, it is commonly found convenient to use this acid as the second essential constituent in chromium plating solutions.

Concentration of Sulphuric Acid

The concentration of sulphuric acid in the solution is a matter of considerable importance, and it must bear a fixed relationship to the chromic acid content. Thus, for average working conditions, one part by weight of sulphuric acid should be added for every hundred parts of chromic acid present in the solution. If the proportion of sulphuric acid is lower or higher than this there will be a tendency for the cathode efficiency to be reduced, so much so that in the absence of sulphuric acid from the solution, or in the presence of a considerably greater proportion than that stated above, little or no deposit will be obtained. A further detrimental effect caused by too low a concentration of sulphuric acid is the production of deposits covered with a brownish film.

It has been found possible to produce deposits of chromium from solutions containing as little as 100 gms. of chromic acid and as much as 600 gms. of chromic acid per litre, but for general purposes most workers prefer a bath of moderate concentration, of which the following composition is typical :—

	Gms. per litre.	Ozs. per Imperial gallon.
Chromic acid (CrO_3)	250	40
Sulphuric acid	2·5	0·4

No other added substances are essential for satisfactory working. The most important chemical change occurring is the reduction of a part of the hexavalent chromium to the trivalent state. Some workers have, therefore, favoured the deliberate initial reduction of part of the hexavalent chromium to the trivalent state by chemical or electro-chemical means, or the addition of compounds of trivalent chromium, such as the hydroxide or carbonate. The presence of trivalent chromium in a chromium plating solution is probably essential if good results are to be obtained, and baths which are working satisfactorily are usually found to contain up to 2 per cent. of this substance. It is, however, important for a number of reasons that the concentration of trivalent chromium in the solution should be limited.

Additional Substances Unnecessary

In spite of the fact that excellent results may be obtained from a solution made up from chromic acid and sulphuric acid alone, a large number of other substances have been patented as offering advantage when added to chromium-depositing solutions. Such additions fall into two classes : (*a*) Additions of substances such as chlorides, fluorides, borates, phosphates in place of, or auxiliary to, the usual sulphate additions ; and (*b*) additions of salts, usually hydroxides or carbonates, of metals such as nickel, zinc, copper, the heavy and alkaline earth metals as well as chromium. Schneidewind has drawn the conclusion that no fundamental improvement is obtained by such additions.

The most striking features in which chromium plating differs from most other metal deposition processes are the high current density necessary, the low current efficiency obtained, and the pronounced differences in the character of the deposit that result from variations of the current density, temperature and composition of the solution. In general, the efficiency increases with increasing current density or decreasing temperature, and the appearance of the deposit changes from a bluish coloured deposit having a bright matte surface to one with a bright lustrous appearance, and finally to a dark-coloured iridescent deposit often described as "burnt." The bluish deposit with a bright matte surface is usually extremely thin, and of no commercial value. The bright lustrous deposit is extremely hard and decorative, and needs little or no subsequent polishing. The dark matte deposit is obtained at much higher efficiency than the bright lustrous coating and, though still extremely hard, can be polished by the usual methods. The resulting plate is somewhat darker than the coating deposited in the bright condition.

The balance of current density and temperature necessary, in a given solution, to obtain the bright lustrous deposit, is very sharply defined and, moreover, varies with the nature of the cathode metal. A considerable amount of data has been empirically accumulated on the optimum average current density range in which a bright deposit may be produced. It is desirable that this range should be as wide as possible. The desired end is best achieved if a solution of chromic and sulphuric acid in the ratio, and approximately in the concentration, already suggested is used; if the bath is kept as free as possible from trivalent chromium ; if the current density is moderately high (*i.e.*, 100-300 amps/sq. ft.) ; and if the surface of the cathode is formed of a metal of high hydrogen overvoltage (such as copper).

Influence of the Cathode Metal

The nature of the cathode material, and, in particular, its hydrogen overvoltage, is an important factor in determining not only the character of the initial deposit of chromium but also the ease with which the cathode may be covered with the deposit. In the case of metals of low hydrogen overvoltage, such as iron and steel, the minimum current density at which chromium can be deposited is higher than, and the range of current densities in which bright deposits may be produced is both different from and more restricted than in the case of metals of high hydrogen overvoltage, such as copper. Once the cathode is completely covered with a coating of chromium, this, by virtue of its own hydrogen overvoltage, demands its own particular range of current densities for the continuance of a bright deposit. The overvoltage of chromium being fairly high, this current density range will only be the same as the "striking" range if the overvoltage of the basis metal is fairly high. It is often desirable, therefore, to coat a metal of low hydrogen overvoltage such as steel with a metal of higher hydrogen overvoltage such as copper, before proceeding to depositing chromium upon it. As nickel has a lower hydrogen overvoltage than copper it is thus not so satisfactory in this respect, but as an undercoat nickel has much to recommend it from the corrosion standpoint, and it is now common practice to deposit a layer of this metal on steel articles prior to chromium plating.

Anodes

Lead anodes are found to be very satisfactory, although they are slowly attacked by chromic acid solutions with the formation of insoluble lead chromate, which, however, has no detrimental action on the bath. Lead of high purity is necessary, impurities, particularly antimony, greatly increasing the rate of attack. Lead anodes, if sufficiently large, tend to cause re-oxidation of trivalent chromium by virtue of their high oxygen overvoltage, and for this reason it is recommended that the area of lead anodes should be at least twice that of the cathode.

One disadvantage of lead is that in course of time an adherent coating of high resistance tends to form upon it, causing, if complete, a high bath voltage. If the coating is not complete

but occurs in patches, its presence is not so easily detected, and it may cause uneven current distribution and patchy deposits. A method of removing this non-conducting coating of lead chromate, involving less labour than scouring, consists in submitting the anodes to the action of a saturated solution of sodium chloride acidulated with hydrochloric acid, which readily dissolves it.

Properties and Applications of Electrodeposited Chromium

Electrodeposited chromium is especially distinguished from other metals by its resistance to atmospheric and other corrosion, its resistance to oxidation and corrosion at elevated temperature, and its extreme hardness and low coefficient of friction. As deposited in the bright condition, chromium has a bright, lustrous metallic surface with a slightly blue colour. The reflectivity is only 65 per cent., but, in contrast with other metals, this figure is permanently maintained, as the chromium is apparently quite unattacked by the atmosphere even at temperatures as high as 300° C., and also by salt water, salt spray, ammonia, nitric acid and hydrogen sulphide. Dilute sulphuric acid and hydrochloric acid only attack the metal vigorously if it is first rendered "active" by cathodic polarisation, *e.g.*, by contact with a piece of zinc also immersed in the acid.

The commercial applications of chromium plating are, of course, too numerous for each to be mentioned. Among the more important applications of the thinner types of deposits are the plating of plumbing fixtures, cheap jewellery and motor-car fittings. The latter have in some cases apparently not given such good service as was hoped, probably owing to the fact that the chromium was deposited directly on to brass. Nevertheless, the standardisation of chromium plating on certain makes of car forecasts considerable popularity in the future.

Advantage has been taken of the high resistance to wear possessed by chromium deposits in applications such as the facing of gramophone record matrices, steel plug gauges, and printing plates, and it has been found that such parts have their serviceable lives increased four to ten times when they are faced with a thin deposit of chromium. Chromium-plated valves for steam and internal combustion engines have been found to withstand the action of hot gases better than similar unplated parts. Reflectors have been successfully plated with chromium.

The low coefficient of friction which chromium possesses makes it a suitable metal with which to coat bearings, machine parts and cams. Rolls for paper finishing and sheet glass manufacture have been found to have a longer life when chromium plated; plating has also been successfully applied in the case of moulds used for the manufacture of glass bottles, synthetic resin and vulcanised rubber articles, as it provides a surface to which the material shows no tendency to adhere. Chromium-plated die-casting and ingot moulds also withstand the solvent action of the molten metal to a considerable extent. Certain parts of chemical plant used in paper-making and petroleum-refining plants have been plated with chromium, and the treatment has proved very successful.

Sir John Brunner's Will

Sir John Fowler Brunner, second baronet, of Harrington Gardens, S.W., and of Sandiway House, Northwich, Cheshire, lately a director of Imperial Chemical Industries, Ltd., chairman of the Brunner Investment Trust, Ltd., director or chairman of several housing corporations, formerly a Member of Parliament, and for many years a director of Brunner, Mond and Co., Ltd., left unsettled property of the gross value of £876,102, with net personalty £850,185. Testator left £4,000 to his son, with the request, but creating no trust in the matter, that he would make provision in his discretion for the servants in his or his wife's employ at the date of his will, July 18, 1924. He left the portrait of his father by Herkomer to his wife for life, with remainder to his son Felix, the other portraits given to him by his father's will to his said son, and to his wife he left the balance of his household and personal effects, consumable stores, live and dead stock, etc., his London residence and Sandiway House, Northwich, £500, and a life annuity of £12,000. He stated that he had already made provision for his daughter, and he therefore left all his other property to his son, the present baronet, absolutely.

A Bookman's Column

The trustification and rationalisation which have been in progress in the chemical industry in the past few years, throughout the world, have naturally left a very confused impression on many minds. Dr. Alfred Marcus is therefore to be congratulated on his enterprise in producing a book dealing with the subject, *Die Grosse Chemiekonzerne* (Leipzig: S. Hirzel, pp. 100, 8 marks, in German). The companies dealt with are as follows: L'Air Liquide (of France), Imperial Chemical Industries, the I.G. Farbenindustrie A.-G., the Kuhlmann company (of France), the Du Pont company (of America), and the Montecatini company (of Italy). The book is illustrated by six large flow-sheets indicating clearly the constituent companies and offshoots of the "Big Six."

* * *

Since the publication, in 1916, of the second edition of Dr. Hausbrand's book, *Evaporating, Condensing and Cooling Apparatus: Explanations, Formulæ and Tables for Use in Practice*, the scientific principles governing the flow of liquids and gases have been firmly established by Stanton and his co-workers at the National Physical Laboratory. For the fourth English edition, revised and enlarged by Mr. Basil Heastie (Ernest Benn, pp. 468, 25s.), the section of the book treating the flow of steam, water and air through pipes has therefore been completely rewritten, and the tables have been recalculated. A short summary of the work of Dr. Ezer Griffiths on heat losses due to convection and radiation has been included; a chapter has been added on modern evaporating plants; and the steam tables have been revised.

* * *

The uses of carbon (especially in the form of activated charcoal, etc.) have grown so rapidly in the last few years that a book dealing with the subject was distinctly wanted. The need is now filled by the publication of *Industrial Carbon*, by Dr. C. L. Mantell, of the Pratt Institute, Brooklyn (Chapman and Hall, pp. 410, 21s.), in which are covered the technical applications of elementary carbon, apart from its use as a fuel. The wide field covered may be indicated by quoting some of the chapter headings: Diamonds, natural and artificial graphite, carbon black, gas adsorbent charcoal, bone black, vegetable decolorising carbon, metal adsorbent chars, pharmaceutical charcoal, electrodes, arc light carbons, battery and welding carbons, resistor carbon and carbon refractories, the physical and chemical properties of carbon, and so forth.

* * *

Professor T. P. Hilditch is to be congratulated on the production of an ideal book. The book in question, *Catalytic Processes in Applied Chemistry* (Chapman and Hall, pp. 360, 16s.), deals with a subject which is assuming great importance in industry. It is divided into four sections: the general principles of catalytic action, catalysis at the surface of solid inorganic materials, catalysis at surfaces of colloidal organic compounds (fermentation processes), and homogeneous catalysis in liquid systems. In the course of a remarkably well-rounded discussion of the whole subject, Professor Hilditch deals with a large number of catalytic processes, including the production of hydrogen (from water-gas), the ammonia synthesis, sulphuric acid, hydrogenation, fermentation, esterification, chlorination, oxidation, and others too numerous to mention. The author has succeeded in producing a volume which, while packed with information, is a delight to read.

* * *

The McGraw-Hill Book Co. have just published *Accounting and Cost Finding for the Chemical Industries*, by G. A. Prochazka (pp. 242, 15s.). The eighteen chapters are grouped in five sections, as follows: Cost accounting prerequisites; determining process costs; determining material costs; the results; and fixed property (plant, etc.). The merciless analysis of costs is perhaps the most characteristic feature of modern scientific industry, and Mr. Prochazka's book, the product of some fourteen years of research work and considerable experience in instructing a staff, will doubtless receive careful attention. Those who, fully realising the urgent need of a sound costing system, have yet quailed before the difficulties often attributed to it, will read with relief the author's statement (introduction, p. vii) that "much costly and tedious experimentation has finally led me to the gratifying conclusion that it is possible to get a firm economic grip on a business with a small clerical force and relatively few printed forms."

The Iron and Steel Institute

Diamond Jubilee

THIS year the Iron and Steel Institute celebrates the Diamond Jubilee of its establishment on February 25, 1869. The roll of the Institute contains the names of many whose membership dates back to the eighteen nineties and the 'eighties, and the following seventeen gentlemen have each a membership of fifty or more years to their credit: Mr. José A. de Ybarra (1870), Mr. H. A. Webb (1872), Mr. C. J. Bagley (Hon. Vice-President), Mr. J. G. Gordon and Mr. W. H. Hewlett (Hon. Vice-President) (1873), Dr. Arthur Cooper (Past President, Bessemer Medallist) and Sir A. J. Dorman (1874), Mr. P. C. Gilchrist, F.R.S. (Hon. Vice-President, Bessemer Medallist) and Mr. George Hatton (Vice-President) (1875), Col. W. Hawdon and Mr. G. H. Strick (1876), Col. R. E. B. Crompton, C.B., and Mr. R. Williamson (1877), the Rt. Hon. Lord Invernairn of Strathnairn (Past President, Bessemer Medallist) and Mr. B. M. Renton (1878), and Mr. R. Main and Mr. A. Pourcel (Hon. Vice-President, Bessemer Medallist) (1879).

The council desire, however, to offer their special congratulations and good wishes to three gentlemen who took up their membership at the inaugural meeting of the Institute held in London on June 23, 1869, namely, Sir Hugh Bell (Past-President, Bessemer Medallist), Mr. John James Bleckly, and Mr. John Neilson. Sir Hugh Bell joined the Institute at the same time as his father, the late Sir Lowthian Bell, the principal founder; Mr. J. J. Bleckly was associated with his brother, the late Mr. W. H. Bleckly, in the management of the Pearson and Knowles Coal and Iron Co.; and Mr. John Neilson is the nephew and also son-in-law of the late James Beaumont Neilson, the famous inventor of the hot blast. To these original members the heartiest good wishes are extended for the continuance of their connection with the Institute for many years to come.

The work of the Institute is well known, and needs no eulogies, and the demands on it grow ever heavier and heavier. In view of the significance of this year in the history of the Institute, the council particularly hope that as many members as possible will be present at the annual meeting on May 2–3, at the annual dinner on the first-named date in London, and at the autumn meeting to be held in Newcastle-upon-Tyne on September 10–12.

Low Temperature Carbonisation in Leeds

THE Leeds Corporation Gas Committee report the result of further negotiations with regard to the proposal of a suggested new company leasing or purchasing the York Street gasworks for the production of smokeless fuel by low temperature carbonisation. The committee state that a representative of a proposed company attended and submitted proposals for the lease or purchase of premises belonging to the Committee for the production of smokeless fuel and for the disposal of the gas produced in connection therewith. After discussing the matter the representative abandoned his proposal to purchase or lease certain premises belonging to the committee, and the further consideration of the offer for the disposal of the gas produced in connection with the industry was adjourned for the submission of revised proposals.

Present from British to German Chemists

SOME two years ago Mrs. Alec Tweedie presented to the Chemical Society a portrait of Liebig, which is said to be the only one in existence. When the Society sent it to Germany last year for the Liebig-Wöhler centenary celebration, it aroused so much admiration that some of the prominent members of the British society decided to subscribe towards the cost of an exact copy. The commission has now been executed, and, according to present arrangement, three officers of the British body—Professor J. F. Thorpe (president), Professor F. G. Donnan (foreign secretary), and Professor C. S. Gibson (joint hon. secretary)—will go to Berlin shortly to present the copy to the German Chemical Society.

Chemical Workers' Wages

Industrial Court's Revised Terms

THE Industrial Court issued an award on Monday on a claim by the National Union of Drug and Chemical Workers for a revision of the wages and conditions of service of drug and fine chemical workers. The union asked for a reduction of the working week from 48 to 44 hours, 12 days' holiday instead of six, payment at the rate of time and a half for all time worked before normal starting time, and numerous alterations in the wages schedule. It was agreed that the portion of the claim relating to certain workers and grading definitions should be deferred for further consideration by the parties.

In their award the Court make the following revision in respect to overtime:—Workers other than piece-workers: Time-and-a-quarter for the first two hours; after first two hours, time-and-a-half up to starting time next morning. Workers employed before the regular starting time shall be paid time-and-a-quarter for the period so worked, or time-and-a-half for the period so worked if such period is in addition to the normal daily hours. Double time on Sundays, Boxing Day, Good Friday, Easter Monday, Whit Monday, August Bank Holiday, Christmas Day, and any other statutory general holiday, or, in Scotland, a corresponding number of public holidays. Each day to stand by itself.

The wage schedules have been revised as follows:—Women, 21 years and over, class 1, 36s. per week; class 2, 30s. per week; juniors, males, a scale ranging from 12s. per week at 14 to 39s. at 20 years of age; females, a scale ranging from 12s. at 14 to 27s. at 20 years of age. No addition to or alteration of the provisions of the agreement is to be made in regard to other items of the claim.

As the result of the new wage schedule contained in the above award, the Drug and Chemical Workers' Union estimates that nearly 10,000 women, girls, and boys will benefit. The union failed in its claim for a 7s. a week advance for adult male workers, and for the reduction of the working week from 48 to 44 hours. Although some of the major claims failed, the union views the award with satisfaction, as it secures an increase of 3s. to youths of 20, 3s. to women and 1s. 6d. to girls and boys in the second grade.

Commission's Report on Holborn Explosions

THE report of the Commission of Inquiry into the explosions and fires which occurred in the neighbourhood of New Oxford Street, Holborn, London, last December, was issued a few days ago. The Commissioners have no hesitation in stating that the explosion occurred in the Post Office Tube; that the evidence has clearly established the fact that it was due to a mixture of inflammable gas and air, but the explosion itself destroyed all direct evidence as to the nature of the inflammable gas present.

After examining the three theories suggesting either coal gas, petrol vapour, or gas from anærobic fermentation, the Commissioners feel able with confidence to say that coal gas was responsible for the explosion. On this point they say: "Apart from the fact that there are in our view insuperable difficulties in accepting any other explanation, the coal-gas theory is consistent with all the facts."

While it was quite impossible after the event to trace with certainty the precise source of the gas, the Commissioners inclined to the view that the gas was present as the result of a gradual accumulation extending over a considerable period, probably increased within a short time of the explosion by an escape not necessarily large in itself, but sufficient to increase the concentration to explosion limit. They also think the evidence consistent with the ignition of the gas by the use by the Post Office workman Thrower of a petrol lighter to enable him to find the socket in which to plug-in the lead from the blower which the Post Office workmen were about to use.

Graesser-Monsanto Appointment

ARISING from the reorganisation of the Graesser-Monsanto Chemical Works, Mr. C. Chapman has been appointed assistant works manager at Ruabon, North Wales. Mr. Chapman was previously general works manager with the Glasgow Corporation Gasworks, and his services will, no doubt, prove helpful to the Graesser-Monsanto organisation, which is very much alive to development.

From Week to Week

THE CONDITION of Sir Max Muspratt is now reported to be satisfactory.

RADIUM is said to have been discovered in the Golconda Mine, near Hopton, Derbyshire.

THE MARRIAGE of Mr. A. H. Kennedy and Miss Constance Kemlo Dormand, both of Liverpool, took place at Toxteth on April 8.

EXPORTS OF INDIGO from India during January amounted to 110 cwt., as compared with 169 and 261 cwt. in the same month of 1928 and 1927 respectively.

AMONG THE FEATURES of the annual meeting of the Society of Chemical Industry in Manchester in July will be a luncheon to the members given by the Clayton Aniline Co.

A FREEHOLD MILL, equipped as a going concern, situated on the outskirts of London, with rail sidings, water power and ample pure water supply from springs, is advertised for sale on page xxviii.

AT A MEETING of the governors of the Torbay Hospital, held on Wednesday, April 3, it was reported that 322·75 milligrammes of radium had been received at the hospital, and that the radium had been insured for £4,404.

EXPORTS of all grades of nickel from Canada in February amounted to 9,735,500 lb., valued at $2,129,156, against 6,895,100 lb., valued at $1,626,426, in February, 1928. This represents a gain of 41 per cent. in volume and 31 per cent. in value.

THE THEODORE W. RICHARDS MEMORIAL LECTURE of the Chemical Society will be delivered by Sir Harold Hartley, F.R.S., in the meeting hall of the Institution of Mechanical Engineers, Storey's Gate, Westminster, London, S.W.1, on Thursday, April 25, at 5.30 p.m.

SHAREHOLDERS in the International Nickel Co. of Canada are requested to send their allotment letters forthwith to the London representative of the company, at Imperial Chemical House, Millbank, London, S.W.1, in order to facilitate the preparation of stock certificates and warrants for dividends on the common and preferred stocks.

THE GOVERNMENT-OWNED PLANT at Toulouse, France, has now undertaken the manufacture of a new fertiliser known as "sulphonitrate"—ammonium calcium sulphonitrate. The output of sulphonitrate at the Toulouse plant is now about 500 metric tons per month, most of which is being sold in the northern part of France directly through the Toulouse nitrogen office.

THE FIFTEEN-MILE BRANCH RAILWAY from Garstang to Knott End, near Fleetwood (absorbed by the L.M.S. Railway some years ago) is to be closed to passenger traffic owing to severe competition from road services. The line will be operated exclusively for goods, an important part of the latter being the mineral traffic of Imperial Chemical Industries, who have large salt mines adjoining the track.

IT IS REPORTED that Imperial Chemical Industries are taking a large interest in a new rayon factory in Yugoslavia. A company is being formed with a capital of over £1,000,000, and the site of the factory is now under consideration by the British interests. Yugoslavia could not absorb the whole production, but it is understood that after careful consideration that country has been chosen as a central manufacturing point for the whole of the Balkans.

THE ANNUAL MEETING of the Manchester Section of the British Association of Chemists was held on April 10 in the Midland Hotel. The chairman, Mr. E. N. Marchant, stated that, despite the Association's policy of limiting membership to those of recognised qualification, membership had increased and was likely to increase further during the coming year. Largely as a result of the activity of the Appointments Bureau, the Unemployment Benefit Fund reserves had reached £3,080.

THE ANNUAL GENERAL MEETING of the Yorkshire section of the Society of Chemical Industry was held at the Hotel Metropole, Leeds, when the following officers for 1929-30 were elected:—Chairman, Mr. W. B. Hill (York); vice-chairman, Professor D. McCandlish (Leeds); and hon. secretary, Professor Norman M. Comber (Leeds). Messrs. H. J. Hodsman (Leeds), Mason (Halifax), Whitelock (Leeds), and Gawler were added to the committee. Dr. E. G. Ritchie, technical manager of Ruths Steam Storage, Ltd., gave a paper on "The Storage of Steam in Industrial Plants," and a discussion followed.

BABCOCK AND WILCOX appealed recently in the New South Wales Court of Appeal, Sydney, against a fine of £1,000 and an order for the payment of £10,000 to the Sydney Electricity Department. The fine was imposed by the Sydney magistrates when the company's agent was found guilty of attempting to bribe the former manager of the Electricity Department in connection with tenders for power plant. The appeal was allowed by a majority judgment, the Court of Appeal holding that there was no evidence to show that the company had authorised the alleged payments. The Australian Attorney-General has announced the decision of the Crown Law Department to appeal against the decision.

PROFESSOR R. WILLSTATTER has been elected an honorary member of the Royal Irish Academy.

RECENT WILLS INCLUDE:—Mr. Edward George Ballard, F.I.C., late H.M. Inspector of Alkali Works (net personalty £605), £2,335.

THE CHROMIUM MINERAL "wolkonskoit," found in Russia, is said to contain a green chromium pigment which protects iron against atmospheric corrosion.

THE ANNUAL GENERAL MEETING of the Oil and Colour Chemists' Association will be held on May 30, and not on May 9, as originally arranged. An ordinary meeting will be held on May 9.

THE STICKSTOFFWERKE A.-G., founded (as mentioned in these columns last week) at Waldenburg, in Silesia, for the manufacture of synthetic nitrogen compounds, will utilise excess coke-oven gas.

MR. C. COWLEY has been appointed secretary of the Antofagasta (Chili) and Bolivia Railway Co., Ltd., and of the Chilian Northern Railway Co., Ltd., to fill the vacancies caused by the death of the late secretary, Mr. A. H. Clinch.

BATH CITY COUNCIL, at their meeting on Wednesday, decided to spend £80,000 on a new technical college. The building of the Royal United Hospital will be purchased for the purpose for £30,000, and £50,000 will be spent on its conversion.

A BILL has been introduced in the Ontario Legislature, in conformity with the Prime Minister of Ontario's "dollar for dollar" plan of assistance for industrial research in Ontario, increasing the contribution of the Province to the Ontario Industrial Research Foundation from $1,000,000, as provided in the 1928 Act, to $2,500,000.

THE CHAIRMAN of J. M. Newton Vitreo-Colloid (1928), states in a circular that as the Ministry of Health declined to allow the proposed factory to be erected at Dunton Green, another site at Oxted has been secured. The plans have been passed, and building will proceed forthwith. The machinery is in an advanced stage of production, and part of it is waiting to be installed.

THE NORTH OF IRELAND "L AND N" CO., LTD., has been formed, with a capital of £250,000 in £1 shares, of which 60,000 will be issued as fully paid in part payment of the purchase consideration, and, of the balance, 140,000 will be available for future issue. The technical consultants are Sensible Heat Distillation, Ltd. The registered office is Bassishaw House, 70A, Basinghall Street, E.C.2.

MR. HENRY ASCOUGH, on his retirement as coke oven manager after 56 years' service with the Newport Ironworks, Middlesbrough, was presented with a wallet of treasury notes and an umbrella from the management and employees at a smoking concert given by the firm on April 4. Mr. Ascough, in his response to the numerous tributes to his valuable services, mentioned that he took charge of the first patent coke oven installed in Teeside.

THE GOLD MEDAL of the Institution of Mining and Metallurgy has been awarded conjointly to the Hon. William Baillieu and William Sydney Robinson "in recognition of their services in the development of the mineral resources of the Empire, with special reference to the zinc and lead industries of Australia." The medal, in duplicate, will be presented at the annual general meeting of the Institution, to be held at Burlington House, London, on Thursday, May 16.

A VERDICT of "Accidental Death" was returned at an inquest at Smethwick on Friday on Joseph Arthur Bannister (18), assistant works chemist, of 28, Galton Road, Warley Woods, who was cycling with a companion who had a football on the handlebar of his machine. The ball came into contact with his knee, causing him to swerve, with the result that Bannister, who was riding behind, collided with his companion's back wheel. Both were thrown, and Bannister received injuries that proved fatal.

A PROPOSAL to exploit large peat areas in New Brunswick has led to the incorporation under Provincial Charter of Peat Moss Products, Ltd., with an authorised capital of $100,000, for the purpose of manufacturing, producing and dealing in peat, peat moss, peat fuel and other products. The Hon. W. F. Todd, former Lieut.-Governor of New Brunswick, has taken an active interest for some years in the outlook for such an industry, and recently appeared before the Provincial Government seeking leases of barrens and bogs, on Crown lands, located largely in Gloucester and Northumberland Counties. The Government has expressed a desire to assist the proposed development by granting the requested leases, under certain restrictions.

Obituary

SIR CHARLES TERTIUS MANDER, of Tettenhall Wood, near Wolverhampton, on April 8, aged 76.

MR. J. B. SHAW, first chairman of the Manchester Section of the Oil and Colour Chemists' Association, on March 14.

DR. JAMES MOIR, analyst in the Mines Department, Johannesburg, South Africa, aged 55. He was born and educated in Aberdeen, and went to South Africa shortly after the Boer War. He was the author of a number of papers published in various scientific journals.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

307,328 and 307,364.—VAT DYESTUFFS, MANUFACTURE OF. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 3, 1927.

307,328. Specification No. 248,519 (see THE CHEMICAL AGE, Vol. XIV, p. 361) describes vat dyestuffs obtained by condensing dibenzanthrones or isodibenzanthrones containing a negative substituent with compounds containing reactive hydrogen atoms. In this invention, such dibenzanthrones or isodibenzanthrones are treated with such amino-anthraquinones or derivatives as contain at least still one reactive hydrogen atom on the nitrogen atom. Solvents or suspension agents of high boiling point such as nitrobenzene, naphthalene, and catalysts such as copper or copper compounds, or acid fixing agents may also be present. The dibenzanthrones or isodibenzanthrones may be substituted by any negative substituents such as halogen atoms or nitro groups. Examples are given of the treatment of dibrom-dibenzanthrone with 1-amino-anthraquinone, dichlor-dibenzanthrone with 1 : 4-amino-methoxy-anthraquinone, and dibrom-isodibenzanthrone with 1 : 4-amino-methoxy-anthraquinone. The products give grey-violet-black shades on cotton.

307,364. These dyestuffs are obtained by treating ms-benzdianthrones, ms-naphtho-dianthrones, allo-ms-naphtho-dianthrones, or ms-anthradianthrones containing at least one halogen atom with nitrogenous compounds containing at least still one reactive hydrogen atom on the nitrogen atom. Amino-anthraquinones and their derivatives are particularly suitable for this purpose. The condensation may also be effected with carbazole, isatine, toluene-sulphamide, etc., and the reaction is preferably effected in the presence of solvents or suspension agents of high boiling point such as nitrobenzene, naphthalene, and catalysts such as copper, or acid fixing agents. The halogen atoms in those of the anthrone derivatives which contain several halogen atoms may be wholly or partly replaced by the nitrogenous radicle. The products give brown-yellow to blue-black shades on cotton and a large number of examples are given.

307,375. RUBBER, PRODUCTION OF. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date December 5, 1927 and June 19, 1928. Addition to 300,719.

Specification No. 300,719 (see THE CHEMICAL AGE, Vol. XIX, p. 589) describes the recovery of crude rubber from ordinary or stabilised latex by treatment with proteases to obtain products of high tensile strength. It is now found that emulsion of synthetic rubber with natural latices may be coagulated by treating with enzymes of animal or vegetable origin having a proteolytic action such as the proteases found in succus caricæ papayæ, *e.g.*, papain or extracts of pancreas or sap from ficus cariaca, ficus rostrata, or ficus bengalensis, or saps of musa species such as banana juice. The products vary according to the nature of the enzymes, and the activity of these may be increased by the addition of hydrocyanic acid or hydrogen sulphide. Neutral products are obtained and washing may be dispensed with.

307,439. ROASTING OF PYRITIC ORES. National Processes, Ltd., 27, Old Broad Street, London, E.C.2, and S. Robson, "The Bungalow," St. Andrews Road, Avonmouth, Gloucester. Application date, Nov. 8, 1927.

The process is for roasting pyritic ores in a finely divided condition to obtain a desulphurised, sintered, or agglomerated product suitable for blast furnacing. The ore is mixed with granular material containing little or no sulphur, and subjected to a blast roast with exclusion of air except that drawn through the charge. The added material may be crushed pumice or slag. The sintered product is practically free from sulphur and the gas obtained contains 5–7 per cent. SO_2, so that it may be used without further treatment for the manufacture of sulphuric acid. The granular material added is in the proportion of 3–5 parts to each part of ore.

307,524. ANHYDROUS METALLIC CHLORIDES, PRODUCTION OF. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application dates, November 7, 1927, and July 14, 1928.

Metallic oxides are treated with phosgene, carbon monoxide, or producer gas, and chlorine. A mixture of carbon monoxide and chlorine is passed over a catalyst which accelerates the formation of phosgene, and the resulting hot gases are passed over the oxide, heat being supplied only for starting the reaction. The conversion of the gases into phosgene results in a temperature of about 500° C., so that the temperature of the oxide does not fall below 500° C. If coal is mixed with the oxide and loss of heat is prevented, the carbon dioxide is converted into carbon monoxide, so that the gases may be used again for the reaction by mixing with chlorine. Examples of the preparation of aluminium chloride are given.

307,529. HYDROGEN AND MIXTURES CONTAINING IT, PROCESSES FOR PRODUCTION OF. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, December 2, 1927.

The starting materials are solid, liquid, or gaseous carbonaceous substances containing hydrogen which have not been obtained in the conversion of hydrocarbons to form unsaturated hydrocarbons. These materials associated with air, oxygen or carbon dioxide, with or without steam, are subjected to the action of an electric arc to obtain carbon monoxide. This is treated with steam to obtain carbon dioxide and hydrogen, and the carbon dioxide is removed. By operating with the correct volume of air it is possible to obtain a nitrogen hydrogen mixture in the correct proportions for the synthesis of ammonia. Examples are given of the treatment of coke-oven gas and natural gas.

307,575. GRANULAR FERTILISERS, PRODUCTION OF. W. J. Worboys, Norton Hall, The Green, Norton-on-Tees, Durham, and Imperial Chemical Industries, Ltd., Broadway Buildings, Westminster, London, S.W.1. Application date, January 9, 1928.

Fertilisers are obtained in granular form by using gelatinous iron and/or aluminium phosphate as binding agent. A soluble salt such as ammonium phosphate obtained by treating rock phosphate containing iron and/or aluminium with sulphuric acid, filtering and neutralising the phosphoric acid with ammonia, is obtained by evaporation as a wet solid containing 7–8 per cent. of water. This material is submitted to extrusion through a perforated plate and the extruded material is cut into granules, which are dried in a current of warm air. Alternatively, the solution may be partly evaporated and then mixed with dry finely powdered ammonium phosphate or a potash salt to obtain a product suitable for extrusion. Fertilisers containing no aluminium or iron phosphate may be mixed with a small amount of these to act as a binder.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 280,240 (A. Kissock), relating to calcium molybdate, see Vol. XVIII, p. 35; 282,783 (Soc. of Chemical Industry in Basle), relating to dyestuffs containing chromium, see Vol. XVIII, p. 205; 281, 703 (I.G. Farbenindustrie Akt.-Ges.), relating to benziminazolone arsinic acids, see Vol. XVIII, p. 127; 297,097 (Vereinigte Stahlwerke Akt.-Ges.), relating to obtaining iron, see Vol. XIX, p. 45 (Metallurgical Section); 298,240 (I.G. Farbenindustrie Akt.-Ges.), relating to pharmaceutical products, see Vol. XIX, p. 543; 299,763 (I.G. Farbenindustrie Akt.-Ges.), relating to water glass solutions, see Vol. XX, p. 13.

International Specifications not yet Accepted

305,195. PRESERVING RUBBER. Goodyear Tire and Rubber Co., 1144, East Market Street, Akron, Ohio, U.S.A. (Assignees of A. M. Clifford, 649, Honodle Avenue, Akron, Ohio, U.S.A.) International Convention date, February 2, 1928.

Compounds which improve the ageing of rubber are obtained

by the reaction of aryl hydroxides and amines in the absence of solvents. Examples are given.

305,198. Catalytic Agents. Holzverkohlungs-Industrie Akt.-Ges., Constance, Baden, Germany. International Convention date, February 2, 1928.

Hydrogenation and dehydrogenation catalysts are obtained by applying a solution of a soluble compound of the catalyst to a carrier which also acts as a precipitant, *e.g.*, copper formate may be applied to granulated magnesia.

305,472. Hydrogen Peroxide. Naamlooze Vennootschap Electrochemische Industrie, 20, Molenweg, Roermond, Holland. International Convention date, February 4, 1928.

Alkaline solutions of hydrogen peroxide, and solutions of sodium peroxide or perborate are stabilised by adding gelatine, glue, casein, keratin, glutenin, gliadin, albumen, etc.

305,487, 305,488, 305,489. Dyes and Intermediates. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention dates, February 3 and 4, 1928.

305,487. The components for making azo dyes include at least one containing a heterocyclic structure of the general formula $(A.R_1)\ x.\ R_2\ (B)\ y$ in which A=nitro groups or reduction stages thereof, such as the azoxy or azo group, or the amino group or acylation products thereof, R_1=a carboxylic ring, R_2=a heterocyclic ring joined to R, by a carbon to carbon linkage, x & y=1 or 2, and B=a halogen atom or a residue introduced in place of the halogen atom combined with R_2 through a nitrogen, oxygen or sulphur atom. Or one or more of the components may be obtained by condensing a heterocyclic compound of the above formula in which A=a nitro group and B=a mobile halogen atom replaced with a compound containing a reactive hydrogen atom attached to a nitrogen, oxygen, or sulphur atom, at least one of these compounds containing the azo group. A large number of examples are given.

305,488. Phenanthridone or a derivative or substitution product is treated with phthalic anhydride or a derivative in the presence of a condensing agent such as aluminium chloride to obtain phthaloyl-phenanthridones and their derivatives and substitution products, which are vat dyes or starting materials for producing dyes. Examples are given.

305,489. A halogenated anthanthrone is treated with sulphur or a substance yielding sulphur, to obtain dyes and intermediates.

305,534. Catalysis. Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude, 48, Rue St. Lazare, Paris. (Assignees of Soc. Chimique de la Grande Paroisse, Azote et Produits Chimiques, 13, Rue des Saussais, Paris.) International Convention date, February 6, 1928. Addition to 268,721.

Specification 268,721 (see The Chemical Age, Vol. XVI p. 558) describes an apparatus in which the reaction gas is passed through the space between the inner and outer walls and then into the reaction chamber. In this invention the gas is heated after passing through the jacket and before admission into the chamber.

305,536. Dye Intermediates. Newport Co., Carrollville, Wis., U.S.A. (Assignees of I. Gubelmann, 1202, Fairview Avenue, R. J. Goodrich, 1233, Fairview Avenue, and E. T. Howell, 522, Hawthorne Avenue, South Milwaukee, Wis., U.S.A.) International Convention date, February 6, 1928.

Benzanthrone is obtained by condensing an anthranol with glycerine in the presence of sulphuric acid, and the mixture is diluted with water to reduce the concentration of acid to 65 per cent. The impurities remain in solution, and benzanthrone and its substitution products are sufficiently insoluble to allow them to be extracted with benzene and its homologues, *o* dichlorbenzene, tetrachlorethane, or ethylene dichloride. The benzanthrone is recovered from the solution.

305,578. Aluminium Chloride. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, February 7, 1928.

Anhydrous aluminium chloride is obtained from raw materials containing both alumina and silica in the presence of carbon or carbon monoxide, by treating with chlorine charged with silicon tetrachloride so that no simultaneous formation of silicon tetrachloride can take place. The silicon tetrachloride can be condensed for use again after separation of the aluminium chloride.

305,588. Chromic Hydroxide and Formates. I.G. Farbenindustrie Akt.-Ges., Frankfort-on Main, Germany. International Convention date, February 7, 1928.

An alkali or alkaline earth chromate solution is reduced with carbon monoxide at 150°–350° C. to obtain chromium green and alkali or alkaline earth formates.

Latest Notifications.

308,243. Process of producing ammonium sulphate by the treatment with gypsum of an ammoniacal solution used for the scrubbing of gases. Union Chimique Belge Soc. Anon. March 20, 1928.

308,566. Process for the production of a disodium phosphate poor in water of crystallisation. Benckiser, Dr. T., Reimann, sen., Dr. A., and Reimann, jun., Dr. A. March 23, 1928.

308,218. Manufacture of basic products from amido-ethers of higher fatty acids. I.G. Farbenindustrie Akt.-Ges. March 19, 1928.

308,220. Process for the manufacture of aromatic hydroxy compounds. I.G. Farbenindustrie Akt.-Ges. March 19, 1928.

308,598. Production of phosphoric acid and hydrogen. Bayerische Stickstoff-Werke Akt.-Ges. March 24, 1928.

308,599. Production of phosphoric acid and hydrogen. Bayerische Stickstoff-Werke Akt.-Ges. March 24, 1928.

308,275. Vulcanisation of natural or artificial rubber. I.G. Farbenindustrie Akt.-Ges. March 20, 1928.

308,278. Filtration of solutions. I.G. Farbenindustrie Akt.-Ges. March 20, 1928.

308,280. Method for the production and use of stable sulpho-acid products of high molecular-weight. Oranienburger Chemische Fabrik Akt.-Ges. April 1, 1927.

308,603. Process for saponifying glycerides of fatty acids. Deutsche Gold-und Silverscheideanstalt vorm. Roessler. March 23, 1928.

308,359. Process for the manufacture of quinizarine sulphonic acid and derivatives thereof. I.G. Farbenindustrie Akt.-Ges. March 22, 1928.

308,365. Manufacture of γ-substituted quinolines and their derivatives. I.G. Farbenindustrie Akt.-Ges. March 22, 1928.

308,614 Process and apparatus for the manufacture of shaped objects from fusible materials. I.G. Farbenindustrie Akt.-Ges. March 23, 1928.

308,617. Manufacture of vat dyestuffs. I.G. Farbenindustrie Akt.-Ges. March 23, 1928.

308,755. Manufacture of synthetic rubber. I.G. Farbenindustrie Akt.-Ges. March 31, 1928.

308,713. Manufacture of anthraquinone derivatives. Chemical works (formerly Sandoz). March 27, 1928.

308,780. Process of producing coloured forms made from cellulose esters. I.G. Farbenindustrie Akt.-Ges. March 29, 1928.

308,786. Production of hydrocyanic acid. Galardi, A. N. March 29, 1928.

308,792. Separation of gaseous mixtures by diffusion. I.G. Farbenindustrie Akt.-Ges. March 31, 1928.

308,651. Manufacture of dyestuffs. I.G. Farbenindustrie Akt.-Ges. March 23, 1928.

308,666. Manufacture of carboxylic acids or derivatives thereof. I.G. Farbenindustrie Akt.-Ges. March 23, 1928.

308,725. Manufacture of titanium compounds. Titanium Pigment Co., Inc. March 27, 1928.

308,660. Process for the manufacture of azo dyestuffs on the fibre. I.G. Farbenindustrie Akt.-Ges. March 24, 1928.

308,661. Insecticides. I.G. Farbenindustrie Akt.-Ges. March 24, 1928.

308,740. Process for the manufacture of isatins. I.G. Farbenindustrie Akt.-Ges. March 27, 1928.

308,830 Process for the manufacture of monoazo dyestuffs. I.G. Farbenindustrie Akt.-Ges. March 30, 1928.

308,831. Process for the manufacture of hydroxy phenoxy quinoline compounds and derivatives and substitution products thereof. I.G. Farbenindustrie Akt.-Ges. March 31, 1928.

Specifications Accepted with Date of Application

282,448. Butyl alcohol and other organic compounds from ethyl alcohol, Process for making. Consortium für Elektro-Chemische Industrie Ges. December 18, 1926.

282,682. Azo dyestuffs which are insoluble in water, Process for the manufacture of. I.G. Farbenindustrie Akt.-Ges. December 22, 1926.

282,683. Monoazo dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. December 23, 1926.

283,118. Indigoid vat dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. January 3, 1927. Addition to 282,805.

290,628. Tin from oxidic stanniferous and plumbiferous materials, Separation of. Huttenwerke Trotha Akt.-Ges., and W. Witter. May 18, 1927.

291,767. Neutralizing free fatty acids by means of glycerine, Process of and apparatus for. Metallges. Akt.-Ges. June 8, 1927.

295,315. Iron and steel insensitives to cold shortness, blue shortness and ageing, Manufacture of. H. J. van Royen. August 9, 1927.
300,246. Acetic acid in the anhydrous state from its aqueous solutions, Continuous process for the manufacture of. Soc. Anon. des Distilleries des Deux Sèvres. November 10, 1927. Addition to 296,974.
306,382. Ammonia oxidation and catalyst therefor. E. I. Du Pont de Nemours and Co. February 18, 1928.
308,181. Methanol, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) September 19, 1927.
308,229. Aldehyde sulphoxylates, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) September 19, 1927.
308,231. Substituted benzoyl halides, Production of. P. F. Bangham, J. Thomas, and Scottish Dyes, Ltd. November 18, 1927.
308,285. Ketonic alcohols, Production of. Nobel Industries, Ltd. (*E. I. Du Pont de Nemours and Co.*) October 21, 1927.
308,468. Ethyl alcohol, Production of. H. G. Smith, C. J. Bridger, and Imperial Chemical Industries, Ltd. March 19, 1928.
308,491. Aluminium alloys. Vickers-Armstrong, Ltd., W. B. Goudielock, and W. Machin. April 13, 1928.
308,516. Alkaline earth titanates, Production of. A. H. Marks and P. Russell. (*Titanium, Ltd.*) May 29, 1928.
308,549. Alloy steels. C. K. Everitt and E. Allen and Co., Ltd. September 20, 1928.

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Associated Lead Manufacturers, Ltd. Removal of arsenic from alloys. 10,712. April 6.
Barnes, R. S., Scottish Dyes, Ltd., Thomas, J., and Wyham, B. Vat dyestuffs. 10,356. April 3.
Blackshaw, H., Imperial Chemical Industries, Ltd., and Lawrie, L. G. Apparatus for examination of dyed materials in artificial light. 9,891. March 27.
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Boot's Pure Drug Co., Ltd., and Marshall, J. Production of monohydric phenols. 9,745. March 26.
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Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of tanning-agents. 9,617. March 25.
Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of acid wool dyestuffs. 9,618. March 25.
Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of condensation products. 9,760. March 26.
Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of alkyl cellulose esters. 10,013. March 28.
Carpmael, A., and Sabalitschka and Nahrmittelfabrik J. Penner Akt.-Ges. Manufacture of materials resistant to micro-organisms. 10,014. March 28.
Carpmael, A. Manufacture of salts of antimonic acid, etc. 10,579. April 5. (Germany, April 7, 1928.)
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Du Pont de Nemours and Co., E. I. Coating compositions. 10,367. April 3. (United States, May 28, 1928.)
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Durand and Huguenin Akt.-Ges. Manufacture of mordant dyestuffs. 10,593. April 5.
Fairweather, D. A. W., Scottish Dyes, Ltd., and Thomas, J. Dyes, etc. 9,613. March 25.
Fletcher, W. B., Imperial Chemical Industries, Ltd., and Wheeler, T. S. Production of hydrogen cyanide. 9,824. March 27.
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Harrison, C. F. R., and Imperial Chemical Industries, Ltd. Destructive hydrogenation of coal, etc. 10,232, 10,234. April 2.
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I.G. Farbenindustrie Akt.-Ges and Johnson, J. Y. Manufacture of fertilisers. 9,558. March 25.
I.G. Farbenindustrie Akt.-Ges. and Johnson J. Y. Working up salt mixtures. 9,559. March 25.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of derivatives of quinoline. 9,560. March 25.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of blue vat dyestuffs. 9,561. March 25.
I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of vat dyestuffs. 9,562. March 25.
I.G. Farbenindustrie Akt.-Ges. Manufacture of tanning agents. 9,617. March 25.
I.G. Farbenindustrie Akt.-Ges. Manufacture of acid wool dyestuffs. 9,618. March 25.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Bearing-surfaces of apparatus, etc. 9,708. March 26.
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I.G. Farbenindustrie Akt.-Ges., and Imray, O. Y. Manufacture of azo dyestuffs. 10,029. March 28.
I.G. Farbenindustrie Akt.-Ges. and Johnson J. Y. Colouring rubber. 10,040. March 28.
I.G. Farbenindustrie Akt.-Ges. Manufacture of dyestuffs. 9,553. March 25. (Germany, March 22, 1928.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of carboxylic acid, etc. 9,554. March 25. (Germany, March 23, 1928.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 9,615. March 25. (Germany, March 24, 1928.)
I.G. Farbenindustrie Akt.-Ges. Insecticides. 9,616. March 25. (Germany, March 24, 1928.)
I.G. Farbenindustrie Akt.-Ges. Printing photographic gelatin layers. 9,723. March 26. (Germany, March 26, 1928.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of isatins. 9,913. March 27. (Germany, March 27, 1928.)
I.G. Farbenindustrie Akt.-Ges. Holder for photographic image carriers. 10,031. March 28. (Germany, April 18, 1928.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of monoazo dyestuffs. 10,036. March 28. (Germany, March 30, 1928.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of hydroxyphenoxy-quinoline compounds, etc. 10,037. March 28. (Germany, March 31, 1928.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of artificial sponges. 10,071. March 28. (Austria, March 30, 1928.)
I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of hydrocarbons. 10,199. April 2.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of urea. 10,200. April 2.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Halogenation of cyclic compounds. 10,325. April 3.
I.G. Farbenindustrie Akt.-Ges. and Imray, O. Y. Manufacture of heterocyclic bases of amino-imidazoline series. 10,334. April 3.
I.G. Farbenindustrie Akt.-Ges and Johnson, J. Y. Chlorination, etc., of isocyclic compounds. 10,578. April 5.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Iodination of organic compounds. 10,693. April 6.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of compounds of anthraquinone series. 10,694. April 6.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of vat dyestuffs. 10,695. April 6.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of alcohols. 10,696. April 6.
Imperial Chemical Industries, Ltd. Manufacture of indoles. 9,728. March 26.
Imperial Chemical Industries, Ltd., and Saunders, K. H. Manufacture of mercaptobenzthiazol. 9,729. March 26.
Imperial Chemical Industries, Ltd., McAulay, J., and Wheeler, T. S. Production of hydrogen, etc., cyanide. 9,826. March 27.
Imperial Chemical Industries, Ltd. Production of derivatives, etc., from coal. 9,879. March 27.
Imperial Chemical Industries, Ltd. Hydrogenation of coals. 10,135. April 2.
Imperial Chemical Industries, Ltd. Production of hydrocarbons. 10,231. April 2.
Imperial Chemical Industries, Ltd. Vulcanisation of rubber, etc. 10,507. April 4.
Imperial Chemical Industries, Ltd., and Lawrie, L. G. Production of cellulose derivatives. 10,508. April 4.
Kalle and Co. Akt.-Ges. Development of diazotypes. 9,580. March 25. (Germany, March 24, 1928.)
Riley's Chemicals and Colours, Ltd. Manufacture of satin white. 9,949. March 28.
Schering-Kahlbaum Akt.-Ges. Manufacture of phenol ethers, etc. 9,619. March 25. (Germany, March 23, 1928.)
Scherin-Kahlbaum Akt.-Ges. Manufacture of anhydrous formic acid. 9,757. March 26. (Germany, March 27, 1928.)
Schering-Kahlbaum Akt.-Ges. Diminishing, etc., the loss of carbohydrates in stored root crops. 9,915. March 27. (Germany, March 28, 1929.)
Selden Co. Catalytic oxidation of ammonia. 9,660, 9,674. March 26. (United States, April 14, 1928.)
Society of Chemical Industry in Basle. Manufacture of dyestuffs. 10,475. April 4. (Switzerland, April 4, 1928.)
Titanium Pigment Co., Inc. Manufacture of titanium compounds. 9,585. March 25. (United States, March 27, 1928.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2 cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMON A SULPHATE.—£38 per ton d/d.

POTASH CAUSTI :.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3⅞d. per lb., ex-wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6¼d. to 6¾d. per lb. Crude 60's, Mar., 1s. 10½d. per gall. April/June, 1s. 10d. per gall.

ACID CRESYLIC 99/100.—2s. 3d. to 2s. 10d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 10d. to 1s. 11d. per gall. Dark, 1s. 7½d. to 1s. 8½d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED.—5½d. to 6d. per gall. for 1080/1090. Unstrained, 6⅝d. to 7d. per gall.

BENZOLE.—Prices at works: Crude, 1cd. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 7½d. to 2s. per gall. Firm. Pure, 2s. to 2s. 2d. per gall.

XYLOL.—1s. 5d. to 2s. per gall. Pure, 1s. 8d. to 1s. 9d. per gall.

CREOSOTE.—Cresylic, 20/24%, 7⅛d. to 7⅜d. per gall.; Heavy, 6½d. to 6¾d. per gall. Middle oil, 4⅝d. to 5⅛d. per gall. Standard specification, 3⅝d. to 4⅞d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 9d. per gall. Solvent, 90/160, 1s. 3½d. to 1s. 4d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 8d. per gall. Solvent 90/190, 1s. 1d. to 1s. 4d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £12 5s. to £14 10s. per ton. Quiet Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 31s. 6d. to 35s. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 4s. to 4s. 6d. per gall. 90/180, 2s. to 3s. per gal. Heavy, 1s. 6d. to 1s. 9d. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. 3d. to 2s. 6d. per lb.

DICHLORANILINE.—1s. 10d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITHROBENZENE.—8d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 7½d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 9d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10½d. per gall. 16° Tw.

WOOD CRESOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton.

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £54 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—4⅝d. to 5¾d. per lb.

LAMP BLACK.—£32 10s. per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£23 per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£10 to £12 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra

SULPHUR PRECIP. B. P.—£55 to £60 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. 10d. to 7s. per lb.

ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 4d. to 2s 5d. per lb.

ACID, BENZOIC, B.P. 2s. to 3s. 3d. per lb., according to quantity.

SOLELY EX GUM, 1s. 3d. to 1s. 4d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carraige paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—2s. 3d. to 2s. 4d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5½d. to 1s. 7d. per lb. Technical.—10½d. to 11½d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 4½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE —5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.
BISMUTH CARBONATE.—9s. 9d. per lb.
BISMUTH CITRATE.—9s. 3d. per lb.
BISMUTH SALICYLATE.—8s. 9d. per lb.
BISMUTH SUBNITRATE.—8s. 3d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 9d. per lb.
BISMUTH OXIDE.—12s. 3d. per lb.
BISMUTH SUBCHLORIDE.—10s. 9d. per lb.
BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W Qts. 11d. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 2s. to 2s. 3d. per lb.; potassium, 1s. 8½d. to 1s. 11½d. per lb.; sodium, 1s. 11d. to 2s. 2d. per lb.; granulated, ½d. per lb. less; all spot. Large quantities at lower rates.
CALCIUM LACTATE.—B.P., 1s. 2½d. to 1s. 3d. per lb.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 5½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—11d. to 1s. per lb., according to quantity other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—1s. 11d. to 2s. 2d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 9d. per lb.; potassium, 3s. per lb.; sodium, 2s. 11d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 11d. per lb. Green, 3s. 1d. to 3s. 4d. per lb.; U.S.P., 2s. 9d. to 3s. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¾d. to 9¼d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 22s. per lb. net; Synthetic, 11s. to 13s. per lb.; Synthetic detached crystals, 11s. to 16s. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 6d. per lb.
METHYL SULPHONAL.—8s. 9d. to 9s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—2s. 5d. to 2s. 8d. per lb.
PHENAZONE.—3s. 9d. to 4s. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—97s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 6d. to 2s. 9d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—47s. per lb.; in quantity lower.
SALOL.—2s. 3d. to 2s. 6d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911.—2s. 3d. to 2s. 6d. per lb., B.P.C. 1923—2s. 8d. to 2s. 9d. per lb. U.S.P., 2s. 6d. to 2s. 9d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—100s. to 105s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 2s. 2d. to 2s. 4d. per lb. Crystal, 2s. 3d. to 2s. 5d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—6s. 6d. to 6s. 9d. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 9s. 6d. to 10s. 6d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—6s. 6d. per lb.
AUBEPINE (EX ANETHOL).—11s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—4s. 6d. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 3d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 3d. per lb.
CINNAMIC ALDEHYDE NATURAL.—15s. 6d. per lb.
COUMARIN.—8s. 6d. per lb.
CITRONELLOL.—10s. per lb.
CITRAL.—8s. 3d. per lb.
ETHYL CINNAMATE.—6s. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—13s. 6d. per lb.
GERANIOL (PALMAROSA).—22s. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—5s. per lb.
ISO EUGENOL.—15s. per lb.
LINALOL.—Ex Bois de Rose, 12s. 6d. per lb. Ex Shui Oil, 9s. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 16s. 6d. per lb. Ex Shui Oil Linalol, 10s. per lb.
METHYL ANTHRANILATE.—8s. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—34s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—3s. 9d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. per lb.
RHODINOL.—52s. per lb.
SAFROL.—2s. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—18s. 6d. per lb. Ex Geraniol, 15s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 9s. 6d. per lb.
ANISE OIL.—2s. 9d. per lb.
BERGAMOT OIL.—23s. 6d. per lb.
BOURBON GERANIUM OIL.—21s. per lb.
CAMPHOR OIL.—1s. 3d. per lb.
CANANGA OIL, JAVA.—11s. per lb.
CASSIA OIL, 80/85%.—6s. per lb.
CINNAMON OIL LEAF.—9s. 3d. per oz.
CITRONELLA OIL.—Java, 2s. per lb., c.i.f. U.K. port. Ceylon, pure, 2s. 2d. per lb.
CLOVE OIL (90/92%).—11s. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 10½d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, 17s. 6d. per lb.
LEMON OIL.—20s. per lb.
LEMONGRASS OIL.—4s. per lb.
ORANGE OIL, SWEET.—26s. 6d. per lb.
OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 75s. per oz.
PALMA ROSA OIL.—13s. per lb.
PEPPERMINT OIL.—English, 87s. 6d. per lb.; Wayne County, 14s. 3d. per lb.; Japanese, 7s. 6d. per lb.
PETITGRAIN.—10s. per lb.
SANDALWOOD.—Mysore, 28s. per lb.: 90/95%. 18s. 9d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greef & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, April 11, 1929.

THERE has been a fairly satisfactory volume of business booked during the past week, and the demand for a number of industrial products appears to be broadening. Prices on the whole continue firm, with a tendency for some products to move to higher levels. Export trade is improving, although it still leaves a lot to be desired as regards the quantities of some of the products exported.

General Chemicals

ACETONE.—There is no change in the position of this product, the market continuing firm at £75 to £85 per ton, according to quantity, with supplies for near delivery still short.

ACID ACETIC.—There is a steady demand in evidence, with prices unchanged at the firm rates of £36 10s. to £37 for the usual 80% grade.

ACID CITRIC.—Prices continue to advance, and with the scarcity of raw material there is every likelihood of a further increase in the near future; supplies offering are light.

ACID FORMIC.—Demand is rather patchy, but price is now steady at £42 10s. for 85%.

ACID LACTIC.—Continues steady at £43 per ton for 50% by weight, technical quality.

ACID OXALIC.—Substantial business is being placed for near and forward delivery, with the market firm at £30 10s. to £32 10s. per ton, according to quantity.

ACID TARTARIC.—An extension in the demand is noted, with the price firm at 1s. 4½d. per lb., less 5%.

ALUMINA SULPHATE continues firm, with a scarcity of supplies for near delivery still in evidence; the price is about £7 10s. to £8 per ton.

AMMONIUM CHLORIDE.—Active at firm rates.

ARSENIC.—Only a little interest is shown, and the price remains easy at £16 5s. f.o.r. mines.

BARIUM CHLORIDE.—Demand is not quite so active, although price is well maintained at £11 10s. to £12 per ton for near delivery. Makers appear to be well sold forward.

CREAM OF TARTAR.—Inquiry is improving, and the market is steady at £94 to £98 10s. per ton for 99/100% quality, according to quantity.

COPPER SULPHATE.—Market has been excited, and as is to be expected fluctuations have occurred following the course of the metal. Business is now improving, and with lower prices quoted for the metal it is expected that sulphate prices will tend to become more steady.

FORMALDEHYDE.—There has been a steady business passing, with price firm at £39 per ton.

LEAD ACETATE.—This market has been unsettled following the fluctuations in lead prices, but the market is now becoming more steady with white quality at £45 and brown at £44.

LEAD NITRATE.—A small business has been passing, with price unchanged at £38 per ton.

LIME ACETATE.—In slightly better supply at the firm figure of £18 per ton for the grey quality.

LITHOPONE.—Unchanged at £19 15s. to £22 per ton.

METHYL ACETONE.—A fair trade has been booked at the unchanged price of £58 to £60 per ton.

POTASSIUM CARBONATE AND CAUSTIC.—Small business is passing at unchanged rates.

POTASSIUM CHLORATE.—A better inquiry is being received, with price firm at £28 to £30 per ton.

POTASSIUM PERMANGANATE.—Slightly better demand is in evidence, with the price for B.P. quality firm at 5½d. per lb.

POTASSIUM PRUSSIATE.—Much better inquiry is being received, with supplies for near delivery rather on the short side; the market is very firm at £63 10s. to £65 10s. per ton.

SODIUM ACETATE.—The scarcity of supplies of standard crystal material continues, makers being fully sold for the next few months. The price is already firm at £21 5s. to £22 5s., with a steady demand.

SODIUM BICHROMATE.—There is a satisfactory demand, with the market very firm at British makers' prices of 3½d. per lb., with the usual discounts for contracts.

SODIUM CHLORATE.—After being somewhat slow, there is an improving demand for the product, and the price is firm at £25 per ton.

SODIUM HYPOSULPHITE.—With the approach of the season, the photographic quality is in much better request, and the market is firm. Commercial quality is only in moderate demand.

SODIUM NITRITE.—Steady conditions rule this market with price unchanged at £20.

SODIUM PHOSPHATE.—There has been a slightly better demand for the dibasic quality at £12 per ton, with the tribasic scarce and higher at £17 10s.

SODIUM PRUSSIATE.—The market holds firm at the recently advanced price of 4¾d. to 5½d. per lb., with a satisfactory demand.

SODIUM SULPHIDE.—Only a small trade is passing, although the price is steady.

TARTAR EMETIC.—Unchanged, with a fair demand at 10½d. per lb.

ZINC SULPHATE.—Firm at £12 10s., and in moderate request.

Coal Tar Products

There is little change to report in the prices of coal tar products from last week, the market remaining quiet.

MOTOR BENZOL remains at about 1s. 8¾d. per gallon, f.o.r. makers' works.

SOLVENT NAPHTHA is unchanged at about 1s. 3d. per gallon, f.o.r. makers' works.

HEAVY NAPHTHA is quoted at 1s. 3d. per gallon on rails.

CREOSOTE OIL remains weak, and is quoted at 4¾d. per gallon on rails in the north, and at 5½d. per gallon in London.

CRESYLIC ACID remains unchanged, the 98/100% quality being quoted at about 1s. 10d. per gallon, and the dark quality, 95/97%, at about 1s. 8d. per gallon f.o.r.

NAPHTHALENES.—The firelighter quality remains at about £4 10s. per ton, the 74/76 quality at £5 per ton, and the 76/78 quality at £6 to £6 5s. per ton.

PITCH.—There is little business, and prices remain weak at 30s. to 32s. 6d. per ton f.o.b.

Nitrogen Products

Sulphate of Ammonia.—During the past week the sulphate of ammonia market has remained steady at £10 2s. per ton, f.o.b. U.K. port, in single bags. There is no further interest in forward positions. No doubt the trade is waiting for the announcement of prices from the continental producers.

Home.—Merchants all over the country report a very active trade in sulphate. The condition of the soil is now ideal for working, and farmers appear to be purchasing on a larger scale than normally.

Nitrate of Soda.—It is understood that a good demand from consumers has set in, and that large movements of nitrate are taking place at scale prices.

Latest Oil Prices

LONDON, April 10.—LINSEED OIL was in fair request at barely previous rates. Spot, ex mill, £29 5s.; April, £28 5s.; May-August, £28 10s.; and September-December, £29 5s., naked. RAPE OIL was slow. Crude extracted, £41 10s.; technical refined, £43 10s., naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £28; refined common edible, £34; and deodorised, £36, naked, ex mill. TURPENTINE was quiet and 3d. per cwt. lower. American, spot, 42s. 6d. taken; 42s. 9d. sellers; May-June, 42. 9d.

HULL.—LINSEED OIL.—Spot and April, £28 5s.; May-August, £28 10s.; September-December, £28 17s. 6d. per ton, naked. COTTON OIL.—Bombay crude, spot, £27; Egyptian crude, spot (new), and April and May-August, £27 5s.; edible refined, spot and April and May-August, £30 15s.; technical, spot, £30 10s.; deodorised, spot, £32 15s. per ton, naked. PALM KERNEL OIL.—Crude, 5½ per cent., £34 10s. per ton, naked. GROUNDNUT OIL.—Crushed-extracted, £33 10s.; deodorised, £37 10s. per ton. SOYA OIL.—Extracted and crushed, £30 10s.; deodorised, £34 per ton. RAPE OIL.—Crushed-extracted, £41 10s.; refined, £43 10s. TURPENTINE.—Spot, 45s. per cwt., net cash terms, ex mill. CASTOR OIL and COD OIL unaltered.

South Wales By-Products

INTEREST has been aroused in South Wales by the announcement that colliery owners in the Bridgend (Mid Glamorgan) area are contemplating the erection of by-product works capable of dealing with approximately 600 tons of coal per day. No definite steps have yet been taken, but it is expected that an official announcement will be made within the next few weeks. South Wales activities in by-products are unchanged. All products are quiet and quotations are weak. Pitch continues to have only a small demand and prices remain easy round 32s. 6d. to 35s. per ton delivered, and 31s. to 32s. per ton f.o.b. Refined tars have a slightly better call, but values are unchanged.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, April 10, 1929.

THE heavy chemical market during the past week has shown a slight improvement on conditions prevailing for a week or so, there being a good amount of inquiry going around both for home consumption and export. There are no changes of any importance to record.

Industrial Chemicals

ACETONE, B.G.S.—£76 10s. to £85 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—98/100% glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £38 per ton packed in bags carriage paid U.K. stations. There are few fairly cheap offers made from the Continent.

ACID CARBOLIC, ICE CRYSTALS.—Unchanged at 6¼d. per lb. delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Quoted 2s. 2½d. per lb., less 5% ex store, spot delivery. Offered at 2s. 2¼d. per lb., less 5%, ex wharf, prompt shipment from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC, 80° QUALITY.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Price remains unchanged at about 3½d. per lb., ex store. Offered for prompt shipment from the Continent at 3⅜d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works for 144° quality; £5 15s. per ton for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Spot material now quoted 1s. 4½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Spot material rather dearer at about £6 per ton, ex store. For prompt shipment, £5 15s. per ton c.i.f. U.K. ports.

ALUM, LUMP POTASH.—Unchanged at about £8 12s. 6d. per ton c.i.f. U.K. ports. Crystal meal offered on spot at £9 per ton, ex store.

AMMONIA ANHYDROUS.—Quoted 9½d. per lb. carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton; powdered, £38 per ton packed in 5 cwt. casks delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb. delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanizers crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton c.i.f. U.K. ports.

ANTIMONY OXIDE.—Now quoted £37 10s. per ton c.i.f. U.K. port, prompt shipment from China. Spot material still on offer at £40 per ton, ex store.

ARSENIC, WHITE POWDERED.—Unchanged at £18 5s. per ton, ex wharf, prompt despatch from mines. Spot material quoted £19 15s. per ton, ex store.

BARIUM CHLORIDE.—Quoted £10 10s. per ton c.i.f. U.K. ports, prompt shipment.

BLEACHING POWDER.—British manufacturers contract price to consumers unchanged at £6 12s. 6d. per ton delivered in minimum 4 ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 5s. per ton to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton f.o.r. works or £4 12s. 6d. per ton f.o.b. U.K. ports.

FORMALDEHYDE 40%.—Good inquiry and price unchanged at about £37 10s. per ton, ex store.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—On offer at £29 15s. per ton, ex store.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted £41 10s. per ton. Brown on offer about £39 10s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½%, delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance of 2½% for minimum, 2½ tons to be taken.

POTASSIUM CARBONATE, 96/98%.—Spot material now quoted £26 10s. per ton, ex store. Offered from the Continent £25 10s. per ton, c.i.f. U.K.

POTASSIUM CHLORATE, 99¾/100%.—Powder quoted £25 10s. per ton, ex wharf. Crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 9d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Offered for prompt shipment from the Continent at 6¾d. per lb., ex wharf. Spot material quoted 7d. per lb., ex store.

SODA CAUSTIC, POWDERED, 98/99%.—Now £17 10s. per ton in drums, £18 15s. per ton in casks. Solid, 76/77%, £14 10s. per ton in drums, and 70/72% £14 2s. 6d. per ton in drums, all carriage paid buyer's stations, minimum 4 ton lots, for contracts 10s. per ton less.

SODIUM ACETATE, 65%.—Crystal quality quoted about £19 15s. per ton, ex wharf. 73/78% anhydrous quality on offer at £20 per ton, carriage paid buyer's stations.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—3½d. per lb. delivered U.K. or c.i.f. Irish ports, less 2½% for contract minimum 2½ tons.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum 4 ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4 ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4 ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Ordinary quality quoted £10 12s. per ton, carriage paid buyer's sidings, minimum 6 ton lots, usual extras for small quantities and refined qualities.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, 52s. 6d. per ton delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid, 60/62%, £9 per ton. Broken, 60/62%, £10 per ton. Crystals, 30/32%, £7 2s. 6d. per ton, delivered buyer's works on contract, minimum 4 ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £10 7s. 6d. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE, 98%.—British material now quoted £22 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Offered from the Continent at about £10 5s. per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

British Cyanides Co's. Progress

A PROGRESS report issued by the British Cyanides Co. states that the new plant for the recovery of sulphocyanide was completed at the Nechells Works of the Birmingham Corporation before the contract date. It is working well, and the first consignment of liquor reached the company's works before Easter. The Beetle Products Co. has been earning profits regularly since the last report. An agreement has recently been concluded with Dr. Leon Lilienfeld, of Vienna, for the formation by the company, jointly with him, of a new company to demonstrate on a practical scale the value of Dr. Lilienfeld's inventions for the treatment of cotton yarn and fabrics and to license their use. This new company will acquire the rights of Dr. Lilienfeld's patents and of the British Cyanides Co.'s cotton patent for the world with the exception of the U.S.A. The capital required by this new company will be provided by the British Cyanides Co., whose liquid resources, after paying for the sulphocyanide recovery plants at Nechells and Saltley and for various factory extensions, including those of the Streetly Manufacturing Co., at the end of February exceeded £160,000.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, April 11, 1929.

Business in chemicals on this market during the past week has, on the whole, got back to about where it was before the Easter holiday, although conditions are still rather patchy, with sellers complaining, in some instances, of the very moderate weight of new business on the open market. With regard to contract deliveries, considering the unsettled conditions in the cotton and dependent industries locally, specifications are not unsatisfactory.

Heavy Chemicals

Only a relatively quiet trade is being done in sulphide of sodium, but values are maintained at recent levels, the commercial material being quoted at about £8 per ton and the 60-65 per cent. concentrated solid at £9. Conditions in respect of phosphate of soda have been featureless and prices seem to be easy in tendency at round £11 10s. per ton. The basis price of bichromate of soda continues at 3½d. per lb. up to the end of the half-year; a fair amount of buying interest in this material is being shown. There is a moderate inquiry about for caustic soda at the contract range of £12 15s. to £14 per ton, according to grade. Both bicarbonate of soda and alkali are moving off fairly freely, and there is no alteration in the price position to be reported, current offers being at £10 10s. and £6 per ton, respectively. Prussiate of soda meets with a quietly steady demand at firm prices, these ranging from 4½d. to 5d. per lb., according to quantity. Inquiry for chlorate of soda is rather inactive at the moment, but offers of this are maintained at round 2¾d. per lb. A quiet trade is being put through in the case of saltcake, with prices at from £2 12s. 6d. to £2 15s. per ton. Buying interest in hyposulphite of soda is on moderate lines; the photographic quality keeps reasonably steady at about £15 10s. per ton, with the commercial material quoted at from £8 15s. to £9.

With regard to chlorate of potash, inquiry for this just now is on the quiet side, but prices have been maintained at from 3d. per lb. Yellow prussiate of potash is attracting a fair amount of attention and values are well held at from 6¾d. to 7¼d. per lb., according to quantity. Permanganate of potash keeps steady at round 5⅜d. per lb. for the B.P. quality and 5⅛d. for the commercial, a quiet trade in this section having been done during the past week. Bichromate of soda continues to sell in moderate quantities, with quotations still at round 4¼d. per lb. Caustic potash is firm and in fair request at from £33 5s. per ton for prompt delivery of one to five-ton lots. There has been little change in the position of carbonate of potash, current quotations for which are at about £26 5s. per ton.

Inquiry for arsenic is of quiet proportions, and, if anything, the price situation is easy, down to £16 per ton, at the mines, having been quoted for white powdered, Cornish makes. The setback which has occurred during the past week in the market for rough copper has had an unsettling effect on sulphate and buyers are inclined to be very cautious; prices at the moment are largely nominal. For similar reasons the lead products also are easy in tendency, with white acetate at about £42 per ton and brown at £41 per ton, nitrate of lead being on offer at from £34 10s. to £35. Only a moderate demand is about in the case of the acetates of lime, with brown at round £8 15s. per ton and grey at £17.

Acids and Tar Products

The acid products are all fairly steady. Tartaric acid meets with a quietly steady demand and values are well held at up to 1s. 4¾d. per lb. Citric acid is obtainable at about 2s. 2d. per lb., though inquiry this week has not been too active. Acetic acid continues to sell in fair quantities, with the glacial in carboys at £66 per ton and the 80 per cent. commercial at £36 10s. Oxalic acid is steady, but only in quiet request at about £1 12s. per cwt.

Among the by-products, pitch is quiet and easy at £1 11s. per ton, f.o.b. Similar conditions rule in respect of creosote oil, 3½d. per gallon, naked, being about the top price. Solvent naphtha is in quietly steady demand at 1s. 2¾d. per gallon. Crude carbolic acid continues to be quoted at 1s. 9d. to 1s. 10d. per gallon for 60's, with crystals maintained at 6¼d. to 6½d. per lb., f.o.b.

Company News

Sadler and Co.—An interim dividend of 3 per cent., less income tax, is announced, payable on April 16.

Babcock and Wilcox.—A final dividend of 8 per cent., tax free, is recommended on the ordinary shares, making 15 per cent., tax free, for the year ended December 31, 1928.

Lever Brothers.—The net profits for the year 1928 amounted to £5,274,075. The ordinary share capital receives 5 per cent. again, and the amount carried forward is £160,337.

Weardale Lead Co.—The directors have declared an interim dividend of 6d. per share (2½ per cent.), less income tax, payable to all shareholders registered in the books on March 31 last.

Eastman Kodak Co.—It is announced that the net profits for 1928 were $20,110,440 (against $20,142,161 for 1927). After paying preferred dividends of $369,942, common dividends of $16,224,700, and deducting reserve fund of $227,600, the sum left to add to surplus was $3,288,198 (against $3,335,419). The total surplus at the end of December stood at $77,993,676.

Arizona Copper Co., Ltd.—A special meeting of shareholders, at Edinburgh on Wednesday, adopted a resolution approving the sale of the shares of the company in the Phelps-Dodge Corporation to an American syndicate. Sir Arthur Rose, the chairman, stated that for each share of 5s. there would be distributed shortly 40s., and probably there would be 2s. 6d. or 3s. more later.

Amalgamated Zinc (de Bavay's).—The report for the half-year to December 31 states that the profit, comprising interest and dividend, receipts, less usual charges, was £15,788 (against £13,554 for second half of 1927). Including £6,349 brought in (after paying Dividend No. 43 during current half-year), the available total is £22,137, of which £14,137 is placed to equalisation reserve and £8,000 carried forward.

Rio Tinto Co.—The directors have resolved that at the general meeting, to be held on April 24, they will, subject to final audit, recommend a final dividend for the year 1928 on the ordinary shares of 25s. per share, less income-tax, carrying forward about £167,000. This makes a total ordinary dividend for the year of 40s. per share. The final dividend on the ordinary for the year 1927 was 30s. per share, making a total of 50s. per share, when £151,539 was carried forward.

Major and Co.—A circular to shareholders states that so far as can at present be ascertained the result of trading for the financial year, which closed on March 31, will enable the directors to recommend the payment of dividends on both 6 per cent. and 7½ per cent. cumulative preference shares. It is intended to hold the annual general meeting in June, and to pay the preference dividends on June 30. It is further stated that prospects have so far improved that there is every hope of being able to resume payment of the dividends next year on the preferred ordinary and ordinary shares.

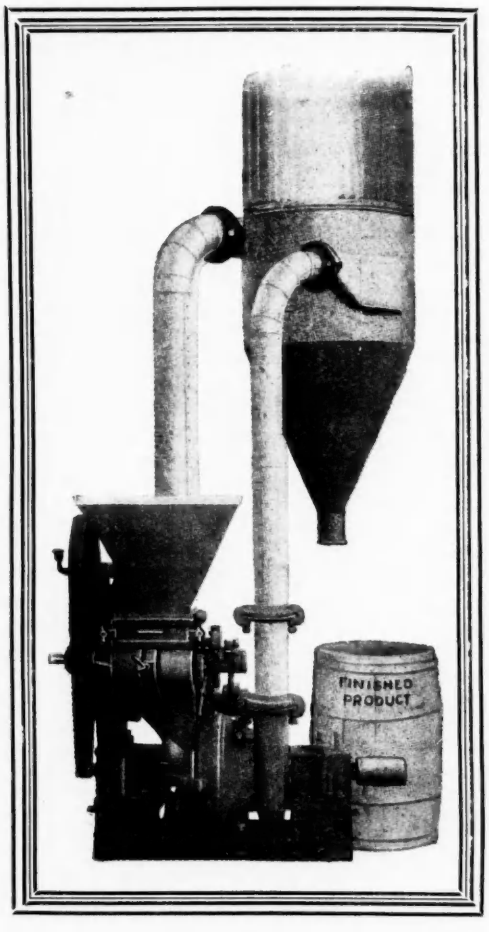
United Molasses Co.—A final dividend of 11 per cent. actual, less tax, on 1,496,590 ordinary shares, making 19 per cent. for 1928, payable on April 25 next, is recommended by the directors, against a dividend of 17 per cent. and a 2 per cent. share bonus on 662,908 shares for 1927. The profit of the company and its associated and subsidiary companies for the year amounts to £539,809, as compared with £386,102 for 1927. From this depreciation must be deducted amounting to £153,136, against £119,853, leaving a balance of £386,673, against £266,249 last time. The directors propose that the capital be increased from £3,000,000 to £6,000,000 by the creation of an additional 2,000,000 ordinary shares and 1,000,000 6 per cent. cumulative preference shares, to be issued on such terms and at such times as they may determine.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

Ammonium Sulphate.—An agent of good standing in Alicante, Spain, wishes to get into touch with British exporters. (Reference No. 305)

RAYMOND



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Etc.	**Etc.**	**Etc.**

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Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

DARE, F. MORDLE AND CO., Springfield Starch Works, Basford, starch manufacturers. (C.C., 13/4/29.) £12 6s. February 19.

NEW PROCESS DYEING AND CLEANING CO., LTD., 94, Farmham Road, Slough, dyers and cleaners. (C.C., 13/4/29.) £31 13s. 4d. October 10.

Deed of Arrangement

[The following deeds of arrangement with creditors have been filed under the Deeds of Arrangement Act, 1914. Under this Act it is necessary that private arrangements other than those executed in pursuance of the Bankruptcy Act shall be registered within seven clear days after the first execution by the debtor or any creditor. These figures are taken from the affidavit filed with the registered deed, but may be subject to variation on realisation.]

MALLINSON, Willie Lee, MALLINSON, George, and MALLINSON, Jacob, trading at Gawthorpe Green, Lepton, as GEO. MALLINSON AND SONS, manufacturing chemists. (D.A., 13/4/29.) Dated March 27, filed April 2. Trustees, G. W. Smith, 23, John William Street, Huddersfield, C.A., and another. Secured creditors, £1,434; liabilities unsecured, £2,028; assets, less secured claims, £1,560.

London Gazette, &c.

Companies Winding Up Voluntarily

GALLOWAY (P. H.), LTD. (C.W.U.V., 13/4/29.) By special resolutions, March 19, confirmed, April 3. F. J. Braybrooks, Broad Street House, Old Broad Street, London, Chartered Accountant, appointed as liquidator for the purpose of winding-up and re-construction. Meeting of creditors, Broad Street House, Old Broad Street, London, on Thursday, April 18, at 5 p.m. All creditors have been, or will be, paid in full.

KEARSLEY (ROBERT) AND CO., LTD. (C.W.U.V., 13/4/29.) By special resolution, March 15, confirmed April 4. A. White, 26-27, Bush Lane, Cannon Street, London, E.C.4, appointed as liquidator.

Bankruptcy Information

ADCOCK, Robert Page (trading as ACME SOAP AND CHEMICAL CO.), 41, Oakfield Street, Cardiff, oil and soap merchant. First meeting, April 19, 11 a.m., 34, Park Place, Cardiff. Public examination, May 9, 11.15 a.m., Law Courts, Cardiff.

New Companies Registered

RICHARD JUDD AND CO., LTD., 97, Grange Road, Small Heath, Birmingham. Registered April 4. Nom. capital, £100 in £1 shares. Wholesale, manufacturing, retail and dispensing chemists, druggists, drysalters, oil and colourmen, etc. Directors: R. J. S. Judd, 97, Grange Road, Small Heath, Birmingham; Amy J. M. Judd, Mrs. Doreen M. Judd.

NEWITT AND SON, LTD. Registered April 9. Nom. capital, £1,000 in £1 shares. To acquire the business of consulting and contracting chemical engineers carried on by E. J. D. Newitt, D. M. Newitt and A. E. Bond, at 46, Southampton Row, London, W.C., as "Newitt and Son." The permanent directors are: E. J. D. Newitt, 13, Camberley Avenue, London, S.W.20; D. M. Newitt and A. E. Bond.

PHOSFERINE PRODUCTS, LTD. Registered as a "public" company on April 4. Nom. capital, £60,000 in 1s. shares. To adopt an agreement with Phosferine (Ashton and Parsons), Ltd. (called the parent company), and to carry on the business of preparers, manufacturers, importers and producers of and dealers in all kinds of salts, acids, alkalis, drugs, medicines, medicaments, herbs, pharmaceutical, chemical, scientific and surgical materials, apparatus and appliances, etc. A subscriber: J. R. Beckensall, 29, Alwyne Villas, Canonbury, London, N.1, and J. R. Bowring.

RADIUM COMPOUNDS, LTD., 68, Victoria Street, London, S.W.1. Registered April 5. Nom. capital, £1,000 in £1 shares. To carry on the business of manufacturers, refiners, importers and exporters of and dealers in radium, radio-active compounds, minerals and materials, luminous paints, pharmaceutical chemicals and products, etc. A director: G. Owen, 20, Winchester Road, London, N.W.3.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the registration of the following Trade Marks can be lodged up to May 3, 1929.

[redacted] SUNDOUR.

499,512. Class 1. Mineral dyes. Morton Sundour Fabrics, Ltd., Dentonhill, Carlisle; manufacturers. January 30, 1929. To be Associated with No. 371,859 (1,984), xxxiv and others.

ERKALEN.

498,824. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives, but not including compositions for the painting and protection of motor body work, paints, colours, varnishes, lacquers or enamels, and not including any goods of a like kind to any of these excluded goods. I.G. Farbenindustrie Aktiengesellschaft (a Corporation organised under the laws of Germany), 28, Mainzer Landstrasse, Frankfurt-on-the-Main, Germany; manufacturers. January 9, 1929. To be Associated with No. 498,825 (2,659) 1. Address for service in the United Kingdom is c/o Albert L. Mond, 19, Southampton Buildings, London, W.C.2.

Unfenced Tank

Gas Company Summoned under Factory Act

THE York Gas Co. were summoned under the Factory and Workshops Act, on Monday, April 8, for failing to have a hot liquid effluent tank securely fenced off on November 28 last year.

Mr. S. R. Bennett, factory inspector, Leeds, for the prosecution, explained that at the York works were two tanks, side by side, into which ammonia liquor residue was run. When one tank was working and the other empty the workmen removed the sludge from the tank not working, and they had to pass over the one tank to get to the other. The charge against the company was that there was no fencing round the tanks, and no gangway, with proper rails at the side across it. The only gangway was a greasy plank. Mr. Bennett added that the Bench had nothing to do with the unfortunate accident that occurred on the date mentioned in the summons, when the works chemist, Mr. Daish, fell into the tank and was fatally scalded.

Mr. Norman Crombie (for the Gas Co.) admitted a technical offence. These settling tanks had been there a great many years, and, though the factory inspectors had been there many times, there had been no complaint about them. The reason there was a plank across at all was because Mr. Daish, the chemist, deemed it his duty to take a sample from the middle of the tank, and if there had been a fence he would have got over it and gone where he did in his zeal to get a sample from the middle rather than at the side. Mr. Daish placed the plank there himself, and when he was conscious he gave no reason for doing so, merely saying he thought he must have slipped. The company had now erected a fence and also put in a gangway, and he (Mr. Crombie) took it that the factory inspectors were satisfied with what had been done.

After a retirement the Lord Mayor announced that the Bench thought a technical offence had been committed, but as there was a little uncertainty about it the company would only be fined £5 and the costs.